The Iron Age

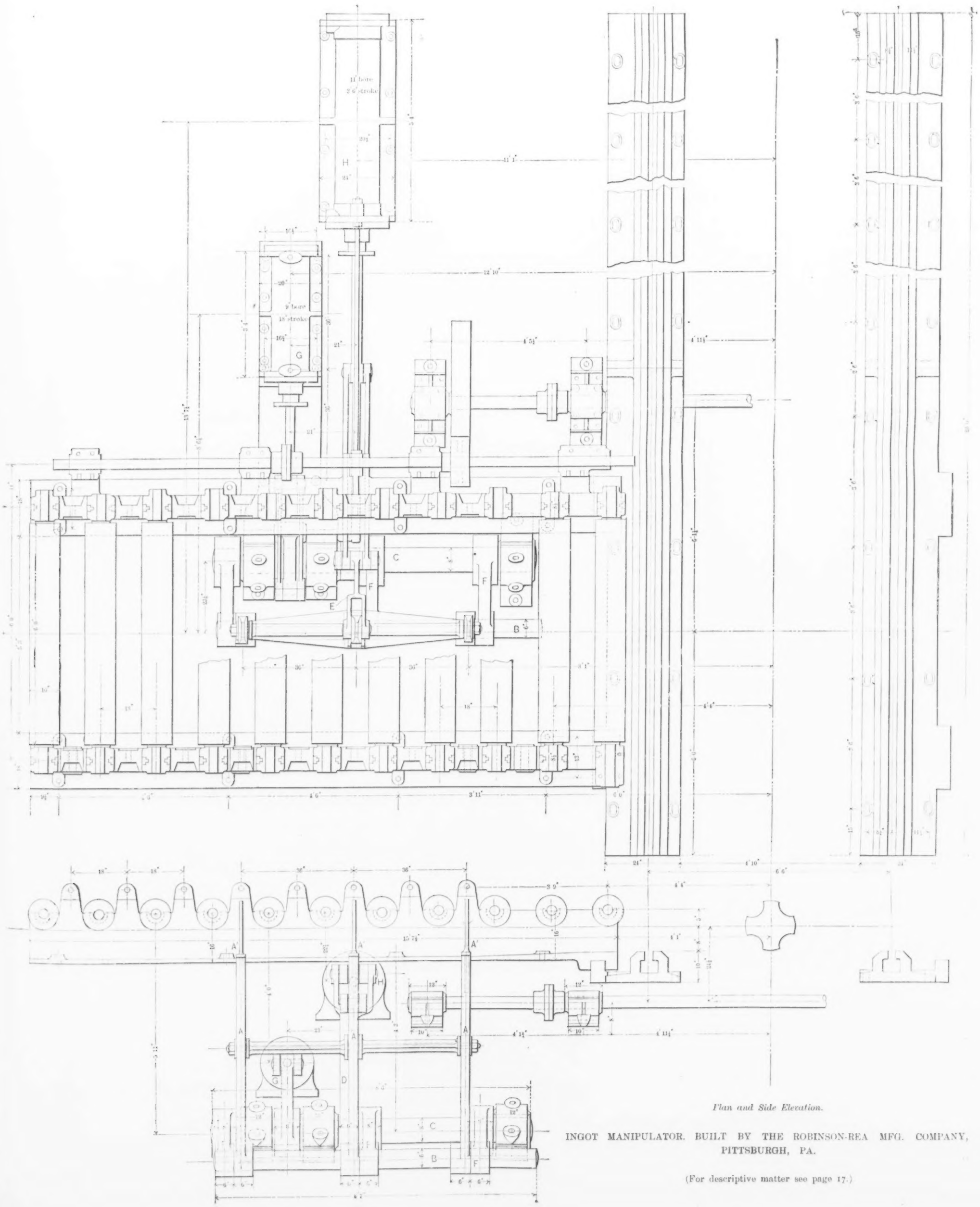
INDEX TO READING MATTER PAGE 36

A Review of the Hardware, Iron and Metal Trades.

INDEX TO ADVERTISEMENTS PAGE 22

Published every Thursday Morning by DAVID WILLIAMS, Nos. 66 and 68 Duane Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXIX: No. 22. *New York, Thursday, June 2, 1887.* *$4.50 a Year, Including Postage. Single Copies, Ten Cents.*



Plan and Side Elevation.

INGOT MANIPULATOR. BUILT BY THE ROBINSON-REA MFG. COMPANY, PITTSBURGH, PA.

(For descriptive matter see page 17.)

ANSONIA BRASS AND COPPER CO.,
MANUFACTURERS OF
PURE COPPER WIRE,
For Electrical Purposes, Bare and Covered.
O'NEILS'S PATENT PLANISHED COPPER.
Seamless Brass and Copper Tubing, Sheets, Bolts, Rods, Wire, O'Neils's Patent Nickel-Plated Copper, &c.,
—IN—
BRASS AND COPPER.

W. E. DODGE, Pres't.
D. P. COWLES, V.-P. and Treas.
L. A. COWLES, Secretary.

Ansonia Refined Ingot Copper, Anchor Brand;
LAKE INGOT COPPER.

19 & 21 Cliff Street,
NEW YORK.

PHELPS, DODGE & CO.,
IMPORTERS OF
TIN PLATE
Roofing Plate, Sheet Iron, Copper, Pig Tin, Wire, Zinc, &c.
MANUFACTURERS OF
COPPER AND BRASS.
CLIFF STREET, NEW YORK.

(Established 1802.)
SCOVILL MFG. COMPANY
WATERBURY, - CONN.,
Manufacturers of
BRASS.—Sheet Brass, Brass Wire, Brass Tubing.
GERMAN SILVER. } Sheet German Silver, German Silver Wire, German Silver Tubing.
BUTT HINGES. } Narrow, Middle, Broad, Desk, Ship, Stop, Spring and Piano-Forte.
BUTTONS. } Military, Naval, Livery, Society, Railroad, School, Lasting, Silk and Dress.
LAMP GOODS. } German Student Lamps, Kerosene Burners, Kerosene Lamps.
PHOTOGRAPHIC } Camera Boxes, Printing Frames, Chemicals, Paper, Glass, &c.
Scovill's Patent Lock Box for Post Offices.
DEPOTS:
423 Broome Street, New York.
177 Devonshire Street, Boston.
183 Lake Street, Chicago.

The Tyler Tube Mill,
MANUFACTURERS OF
Best Lap Welded Boiler Tubes and Pipe.
Works, BOSTON, MASS.

Christiana Rolling Mill Co.,
MANUFACTURERS OF
Boiler Plate and Tank Iron,
8 Oliver St., Boston. **Tyler Bro's** 12 & 14 Cliff St. New York.

Waterbury Brass Co.
ESTABLISHED 1845.
Sheet, Roll and Platers' Brass,
German Silver, Copper, Brass and German Silver Wire, Brass and Copper Tubing,
Copper Rivets and Burs,
Brass Kettles, Door Rail, Brass Tags, Percussion Caps, Powder Flasks, Metallic Eyelets, Shot Pouches, Tape Measures, &c., and small Brass Wares of every description.
Cartridge Metal in Sheets or Shells a Specialty.
Sole Agents for the CAPEWELL MFG. CO.'S Line of Sporting Goods.
DEPOTS: 296 Broadway, New York. 125 Eddy St., Providence, R. I.
MILLS AT WATERBURY, CONN.

THE
New Haven Copper Co.,
SOLE MAKERS OF
POLISHED COPPER
Under Patent of T. James, Sept. 12, 1876.
ALSO MANUFACTURERS AND DEALERS IN
BRAZIERS & SHEATHING COPPER,
Kettles, Bottoms, Bolts, Circles, &c
ALSO MANUFACTURERS OF
Cast Steel Augers and Bits of Superior Quality.
294 Pearl St., NEW YORK.

DICKERSON, VAN DUSEN & CO.
IMPORTERS OF
TIN PLATE, PIG TIN, SHEET IRON, COPPER, WIRE, ZINC, ETC.,
29 and 31 Cliff St., cor. Fulton,
DICKERSON & CO., Liverpool. NEW YORK.

WASHERS
AND
Cold-Punched NUTS for Cars and Unfinished Work.
MASON IRON COMPANY,
2426 Washington Ave., Phila.
M. H. LEONARD, TREASURER.

BROOKLYN WIRE NAIL CO.,
BROOKLYN, N. Y.,
MANUFACTURERS OF
Steel Wire Nails of Every Description.
AGENTS:
Dunham, Carrigan & Co., San Francisco.
Leeds, Robinson & Co., Boston.
A. Baldwin & Co., New Orleans.
F. S. Bradley & Co., New Haven.
A. R. WHITNEY & CO.,
17 BROADWAY, - - - NEW YORK.
WM. EDENBORN, President. J. W. GATES, Vice-President. THOS. W. FITCH, Superintendent. WALLACE H. ROWE, Secretary and Treasurer.

BRADDOCK WIRE COMPANY,
MANUFACTURERS OF
STEEL WIRE RODS,
OFFICE AND WORKS: RANKIN STATION, ALLEGHENY COUNTY, PA.

Iowa Barb Wire Co., 98 Reade Street, New York.

KORTING CONDENSER FOR SALE,
IN GOOD CONDITION.
Size No. 12, Price, $100,
WATERBURY MANUFACTURING COMPANY,
WATERBURY, CONN.

The "Easy" Bolt Clipper

MANUFACTURED BY
PORTER & WOOSTER
66 & 68 Beverly St., Boston.
For sale by the Trade generally.
Send for Circular No. 20.

THE PLUME & ATWOOD MFG. CO.
MANUFACTURERS OF
Sheet and Roll Brass
AND
WIRE,
GERMAN SILVER AND GILDING METAL. COPPER RIVETS AND BURRS, COPPER ELECTRICAL WIRE.
Pins, Brass Butt Hinges, Jack Chain Kerosene Burners, Lamp Trimmings, &c.
18 MURRAY ST., NEW YORK,
71 PEARL ST., BOSTON,
115 LAKE ST., CHICAGO.
Rolling Mill, THOMASTON, CONN. | Factories, WATERBURY, CONN.

BRIDGEPORT BRASS CO.
MANUFACTURERS OF
Sheet and Roll Brass,
BRASS AND COPPER WIRE AND TUBING,
SEAMLESS AND BRAZED TUBING, COPPER AND IRON RIVETS,
Oilers and Cuspadores, Lanterns and Trimmings, Clocks and Fly Fan Movements, Lamps and Trimmings, Kerosene Burners, Plumbers' Materials.
Particular attention paid to cutting out Blanks and manufacturing Metal Goods.
MANUFACTORY, *Bridgeport, Conn.* | WAREHOUSE, *19 Murray St., N. Y.*

Holmes, Booth & Haydens,
WATERBURY CONN.
NEW YORK, 25 Park Place. 22 Murray St.
BOSTON, 18 Federal St.
Manufacturers of all kinds of
Brass, Copper & German Silver
ROLLED AND IN SHEETS.
Brass and Copper Wire, Tubing, Copper Rivets and Burs.
BRASS AND IRON
JACK CHAIN, DOOR RAIL.
GERMAN SILVER SPOONS, SILVER-PLATED FORKS AND SPOONS, KEROSENE BURNERS, &C.

JOHN DAVOL & SONS,
AGENTS FOR
Brooklyn Brass & Copper Co.,
DEALERS IN
Ingot Copper, Spelter, Lead, Tin, Antimony, Solder & Old Metals,
100 John Street, New York.

PASSAIC ZINC CO.
MANUFACTURERS OF
Pure Spelter
FOR
Cartridge Brass, Gas Fixtures, Bronzes
AND ALL FINE WORK.
Also for
GALVANIZERS AND BRASS FOUNDERS.
MANNING & SQUIER, Gen'l Agents,
111 LIBERTY ST. (2d Floor), NEW YORK.

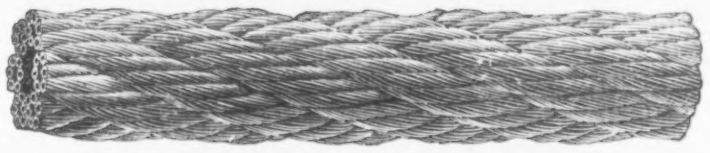
GEO. W. PRENTISS & CO.,
HOLYOKE, MASS.
Manufacturers of
IRON WIRE,

Bright, Coppered, Annealed and Tin Plated. Also GUN SCREW WIRE
Of all sizes, straightened and cut to order.

Established 1830.

THE PLYMOUTH MILLS.
Rivets, Trunk Nails
Tacks Clout Nails,
Burrs, Wire Nails
PLYMOUTH, MASS.

WASHBURN & MOEN MANUF'G CO.,
Worcester, Mass., New York City, Chicago.
EVERY VARIETY OF **WIRE** FOR ALL PURPOSES
Hard and Soft Drawn Copper Wire for Electrical Purposes; Galvanized Iron and Steel Telegraph and Telephone Wire; Glidden Patent Steel Barb Wire, Watch and Clock Main Springs; Eyeglass Springs; Steel Wire for Needles and Drills; Patent Steel Wire Bale Ties; Pump Chain; Two Strand Twisted and Flat Twisted Fence Wire, without Barbs; Fence Staples, Stretchers, &c.; Bright, Annealed, Tinned, and Galvanized and Copper Wire, on Spools 1 oz. to 1 lb.

WIRE ROPE AND CABLE.

Galvanized Iron Wire Rope for Ships' Rigging, &c. Galvanized Steel Wire Cables for Suspension Bridges. Transmission and Standing Ropes, Hoisting Ropes, Tiller Ropes, Switch Ropes, Copper, Iron and Tinned Sash Cord, Phosphor-Bronze and Copper Wire Rope, Wire Clothes Lines, Picture Cord, Galvanized Wire Seizing, and all the Fixtures and Appliances required for use with the foregoing.
SEND FOR PRICE LISTS, CIRCULARS AND DESCRIPTIVE PAMPHLETS.
NEW YORK WAREHOUSE: *16 Cliff Street.*
CHICAGO WAREHOUSE *107 & 109 Lake Street*

ABRAM S. HEWITT, Pres't.
WM. HEWITT, Vice-Pres't.
JAMES HALL, Treas.
E. HANSON, Sec'y.
THE
TRENTON IRON CO.,
(INCORPORATED 1847,)
MANUFACTURERS OF IRON AND STEEL WIRE, AND OF
Steel Wire Bale Ties.
No. 1. HOOK and LOOP FIXED LENGTH TIE.

No. 2. CLOSED HOOK ADJUSTABLE LENGTH TIE.

Prices and Discounts on Application.
Works and Office at TRENTON, NEW JERSEY.
New York Office, COOPER, HEWITT & CO., 17 Burling Slip.
Philadelphia Office, 22 and 24 N. Fourth Street.

WAREROOMS: 87 Liberty St., New York. WORKS: Wilkesbarre, Pa.

A. LESCHEN & SONS ROPE CO.,
Manufacturers of

903 and 905 N. MAIN STREET, ST. LOUIS, MO. Correspondence Invited.

THE CELEBRATED
"SILVER FINISH"
GALVANIZED POULTRY NETTINGS.
FOR SALE BY THE HARDWARE TRADE. GET THE BEST

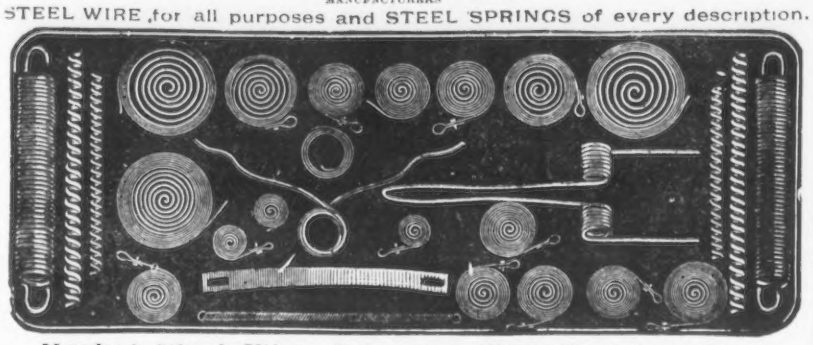
O. LINDEMANN & CO.
MANUFACTURERS OF
Japanned, Brass, Tin Plated and Wood.

BIRD CAGES.

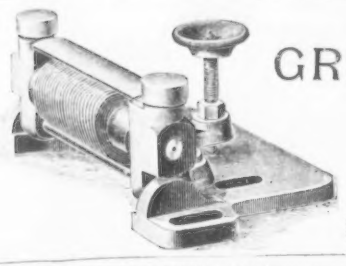
51 BEEKMAN STREET, - NEW YORK.

CARY & MOEN,

MANUFACTURERS
STEEL WIRE, for all purposes and STEEL SPRINGS of every description.



Market Steel Wire, Crinoline Wire, Tempered and Covered.
Also PATENT TEMPERED STEEL FURNITURE SPRINGS, constantly on hand.
234, 236 and 238 West 29th Street, NEW YORK.



Turner's Champion Improved

GRINDSTONE DRESSING MACHINE.

The Best Machine in the Market for Truing the Faces of Grindstones.

Sizes,	4-inch,	6-inch,	8-inch,	10-inch,	12-inch.
Prices,	$7.50.	$10.00.	$12.00	$14.00	$16.00 each.

BLAKE & JOHNSON, Waterbury, Conn.

W. S. Tyler
WIRE WORKS CO.

Successors to W. S. TYLER,
MANUFACTURERS OF
BRASS, STEEL AND GALVANIZED WIRE CLOTH,
FOUNDRY RIDDLES, COKE AND COAL SCREENS.
W. S. TYLER, Pres. E. H. ALLEN, Sec. & Treas.
CLEVELAND, OHIO.

STEEL WIRE STAPLES.

The Gautier Steel Department of Cambria Iron Company, Johnstown, Pa., have a large stock of Black and Galvanized Fence Staples on hand, which they offer to the trade at low prices for prompt shipment.

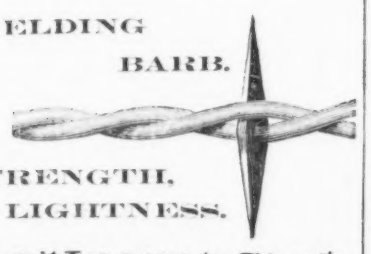
NEW YORK OFFICE, 104 Reade St. CHICAGO OFFICE, Room 12 A, Montauk Block. PHILADELPHIA OFFICE, 523 Arch St.

[No. 190.]

KELLY STEEL BARB

WIRE FENCING.

YIELDING BARB.



STRENGTH, LIGHTNESS.

Don't Lacerate Stock.

Is just as effective, weight LIGHTER per rod, Barbs are FINE STEEL. Does not cost much more than the common, rigid wire barb: is worth double.

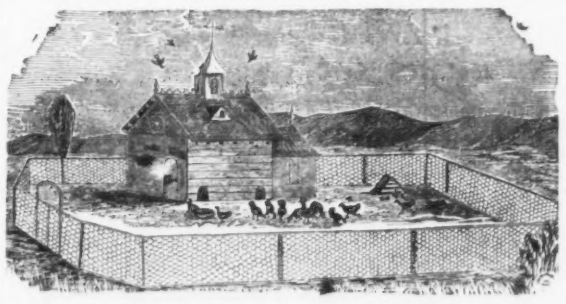
We make galvanized and painted. Our Kelly Paint will LAST LONGER than galvanizing.

This Style of Wire is sold through agents only, HARDWARE MERCHANTS being preferred. It is the *only safe* barb for *horses*.

Country Merchants will find it to their advantage in securing the agency on a class of goods that is in demand and that has no competitor of its kind. We also make both *Two* and *Four-Point Wire Barbs*.

ADDRESS

THORN WIRE HEDGE CO,
CHICAGO.



Estab'd 1818. Incorp'd 1874.
THE
GILBERT & BENNETT MFG. CO.
WAREHOUSES:
42 Cliff St., New York.
228 Lake St., Chicago, Ills.
MANUFACTURERS OF
Iron & Galvanized Wire
Sieves and Wire Cloth.
Power Loom Painted and Galvanized Window Screen Wire Cloth, Galvanized Wire Cloth for Drying Fruits, Warid's Galvanized Web Wire Fence, Galvanized Twist Wire Poultry Netting.
Factories, Georgetown, Conn.

WIRE
TINNED.
MATTRESS.
BROOM.
LANTERN.
Steel Spring.
MARKET.
TACK.
STAPLE.

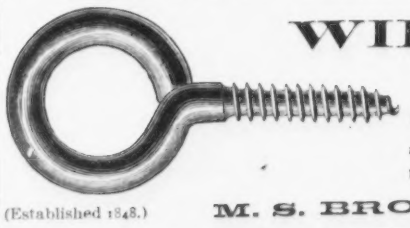
All Sizes
Straightened
AND CUT
TO ORDER.

CORRESPONDENCE SOLICITED

Palmer Wire Mfg. Co
PALMER, MASS.

BRIGHT IRON AND BRASS

WIRE GOODS.

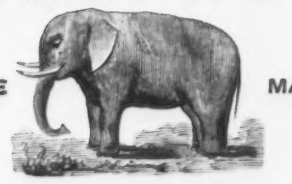


Also Bright Wire Goods for Cotton and Woolen Mills. Wire straightened, cut, milled and bent into any shape, with or without thread. Write for Catalogue and Prices.

(Established 1848.) **M. S. BROOKS, Chester, Conn.**

E. T. BARNUM,
MANUFACTURER
WIRE AND IRON WORK
Detroit, Mich.

PHOSPHOR-BRONZE

TRADE  MARKS:

"Phosphor-Bronze,"

For Bearings, Slide Valves, Cylinder Rings, Cross-Head Gibs, Steps, Bushings, and all purposes where Maximum Durability, Anti-Frictional and Non-Cutting Qualities are desirable. Pump Rods, Bolts and Nuts, Machine and Wood Screws, &c., &c. Combine Toughness, Strength, Durability and Resistance to Corrosion. Castings of all kinds to order. Send for pamphlet and prices.

THE PHOSPHOR-BRONZE SMELTING CO., LTD.,
No. 512 Arch Street, PHILADELPHIA, PA.
Owners of the U. S. Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the U. S.

"THE DETECTIVE
Burglar Alarm."

Patented in this and other Countries

May be applied to any door or window in a few seconds. When the door is opened or the window raised the Alarm falls to the floor, exploding a No. 32 blank cartridge.

Packed complete with four cartridges, weight 6 ounces.

Endorsed by Hon. Wm. B. Smith, Mayor of Philadelphia, and Gen. James A. Stewart, Chief of Police.

Having improved the Alarm and are now manufacturing them in large quantities, we are prepared to quote lower prices than heretofore—viz., **$1.50 per doz.**, or **$15.00 per gross**; no charge for boxing or cartage.

Sample sent by mail on receipt of ten cents. We furnish handsome gilt signs and frames with every order.

110 Gross sold in the past year.

Owned and Manufactured by
Spencer E. Carr & Co.,
Ninth and Jefferson Sts.,
Philadelphia, Pa.

WICKWIRE BROTHERS, CORTLAND, N. Y.,
MANUFACTURERS OF
WIRE CLOTH AND WIRE GOODS

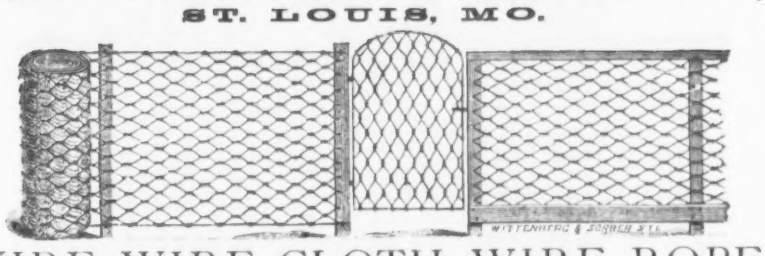
"CORTLAND"
WINDOW SCREEN
WIRE CLOTH.

'Metallic Coal Sieve.'

Dish Covers, Corn Poppers, Coal Sieves, Flour Sieves, Etc., Etc.

LUDLOW-SAYLOR WIRE CO.,

ST. LOUIS, MO.



WIRE, WIRE CLOTH, WIRE ROPE.

Counter Railings, Window Guards, Iron and Wire Fences, Plain and Barbed Fencing Wire.

THOMPSON McCOSH, President. JOHN A. McCOSH, Sec. and Treas.

LIGHTEST, STRONGEST, BEST BARB WIRE IN EXISTENCE.

The above cut represents Preston's Patent Braided Cable Wire Fence Rail, manufactured by the **HOLLOW CABLE MFG. CO., Hornellsville, N. Y.** We also manufacture extensively four different sizes Wire Clothes Lines and a three-ply Braided Wire Web for Bo Bands. Send for Circulars and Price Lists.

F. L. HONORE 48 & 50 Lake St., Chicago Ill.

PENNSYLVANIA ✣ WIRE ✣ WORKS,

231 and 233 Arch St., Philadelphia.

EDWARD DARBY & SONS,

—MANUFACTURERS OF EVERY DESCRIPTION OF—

Brass, Copper and Steel Wire Cloth,

Galvanized Wire Cloth, Galvanized Poultry Nettings.

WIRE STRAIGHTENED AND CUT TO ANY LENGTH.

EXTRA HEAVY LOCOMOTIVE WIRE NETTING, WROUGHT-IRON BEDSTEADS, IRON RAILINGS, COAL AND SAND SCREENS, BANK AND OFFICE RAILINGS, WIRE STALL PARTITIONS AND STABLE FITTINGS.

All Styles of Brass, Wooden and Japanned Cages. Wire Goods of Every Description

CLINTON WIRE CLOTH CO.,

MANUFACTURERS OF EVERY DESCRIPTION OF

WIRE CLOTH, HEX. NETTINGS, WIRE LATH AND FENCING.

Perforated Metals.

GALVANIZERS AND TINNERS OF

WIRE CLOTH and NETTINGS.

Clinton "Standard" (Number 33 Wire)
Painted Window Screen Wire Cloth.

Factory and General Office—CLINTON, MASS.

NEW YORK, 59 Beekman St. BOSTON, 23 Court St. CHICAGO, 137 Lake St.

THE ROYAL DAUBER,

WITH MUD SCRAPER ATTACHED.

This Brush has but to be seen to be appreciated.

An entirely new thing in Blacking Brushes, consisting solely of TINNED MALLEABLE IRON and PURE BRISTLES. **SOLID, ROUND-FACED, INDESTRUCTIBLE.**

SOLID.—Not bored and drawn, nor secured with pitch or cement. Not several small knots, but ONE SOLID KNOT OF PURE BRISTLES. NO HORSEHAIR.

ROUND-FACED.—Takes Blacking from the box on its centre instead of its edges, and will therefore spread it evener, smoother and thinner, ensuring a better polish than any flat-faced brush.

INDESTRUCTIBLE.—Because the only materials used are tin-coated iron and bristles, put together to stay, the knot of bristles being held IN ONE SOLID MASS, BY COMPRESSION, IN A GRIP OF IRON, and fastened with an iron rivet. Warranted not to "spread" or "clog" with blacking.

WILL OUTLAST A DOZEN OF ANY OTHER KIND.

This DAUBING BRUSH is made WITH A SCRAPER FOR REMOVING MUD FROM THE CREVICES OF THE SHOES. The utility of this is too apparent to need a word of commendation.

PEABODY & PARKS, MFRS., TROY, N. Y.

OGDEN & WALLACE,
85, 87, 89 & 91 Elm St., New York.
Iron AND Steel
Of every description kept in stock.
Agents for Park, Brother & Co.'s
BLACK DIAMOND STEEL.
All sizes of Cast and Machinery Steel constantly on hand.

PIERSON & CO.,
(ESTABLISHED 1790.)
IMPORTERS AND DEALERS IN
IRON and STEEL,
And GENERAL COMMISSION MERCHANTS,
24, 25, 26 & 27 West Street, NEW YORK.

ABEEL BROTHERS,
ESTABLISHED 1765
Iron * Merchants,
190 SOUTH ST., 365 WATER ST., NEW YORK.
"CATASAUQUA" IRON.
Large Assortment of Extra Heavy Sizes on Hand.
"ARM CO." SHAFTING.
Also general assortment of Norway, Ulster and Refined Bar, Band, Hoop, Scroll Angle Iron; Steel of all kinds, &c.

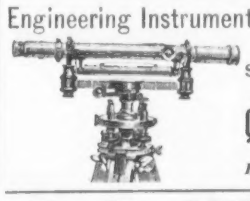
A. R. WHITNEY & CO.,
MANUFACTURERS OF AND DEALERS IN
Iron and Steel
AGENCIES:
PORTAGE IRON CO., Limited, Merchant Iron and Soft Steel and Cut Nails and Spikes.
PARK BRO. & CO., Limited, Steel Plates.
GLASGOW TUBE WORKS. Boiler Flues.
A. M. BYERS & CO., Wrought Iron Pipe.
CARNEGIE BROS. & CO., Limited, Iron and Steel Beams, Channels, Shapes and Shafting.
BROOKLYN WIRE NAIL CO., Steel Wire Nails
THE CHESTER PIPE AND TUBE CO.
Plans and estimates furnished and contracts made for erecting Iron Structures of every description. Books containing cuts of all iron made sent on application by mail. Sample pieces at office. Please address 17 Broadway, New York.
P. O. BOX 33.

Borden & Lovell,
70 & 71 WEST ST.,
L. N. LOVELL, C. A. GREENE, H. L. FREELAND, New York.
Agents for the sale of
FALL RIVER IRON WORKS CO.'S
Nails, Bands, Hoops and Rods.
DANVILLE NAIL & MFG. CO.'S
NAILS AND SPIKES.
BORDEN MINING CO.'S
CUMBERLAND COAL.

JOHN FOX,
Cast Iron Gas and Water Pipe.
2 to 48 Inches Diameter,
160 BROADWAY, NEW YORK.

DANIEL F. COONEY,
88 Washington St., New York,
RON AND STEEL BOILER PLATES.
GLASGOW IRON CO. PINE IRON WORKS.
ALLISON BOILER FLUES.

THE INTERNATIONAL RESOLVENT
Guaranteed to remove and prevent scale in steam boilers. Will send any size package on 60 days' time, to prove goods as represented. Price 7 cents per pound by the barrel; 7½ cents by half-barrel and 8 cents by one-fourth barrel.
Send all communications to
INTERNATIONAL MFG. CO.,
270 Pearl St., Cleveland, Ohio.

Engineering Instruments and Supplies.

Safety Lamps.
QUEEN & CO.,
Philadelphia, Pa.

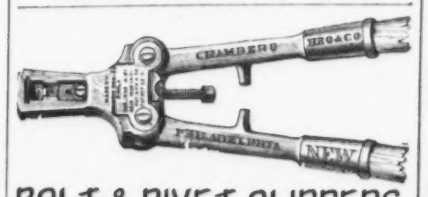
B. F. JUDSON,
Importer of and Dealer in
SCOTCH AND AMERICAN
Pig Iron
WROUGHT & CAST SCRAP IRON,
OLD METALS.
457 & 459 Water St., 233 & 235 South St., NEW YORK.

PHŒNIX
HORSE SHOES.
PHŒNIX HORSE SHOE CO.
POUGHKEEPSIE, N. Y.
New York Office, 20 Reade Street.

Chas. Himrod & Co.,
PIG IRON.
Chicago and Detroit.

JAMES WILLIAMSON & CO.,
SCOTCH AND AMERICAN
PIG IRON,
No. 63 Wall St., New York.

HENDERSON BROS.,
MACHINISTS,
WATERBURY, CONN.,
Manufacturers of
EXHAUST TUMBLING BARRELS
(Illustrated Catalogue sent on application.)

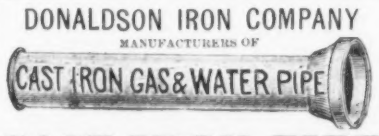


BOLT & RIVET CLIPPERS.
For cutting off the ends of Bolts and Rivets, on carriages, wagons, harness, &c. Ask for them where you buy your hardware, or send for circular and price list.
CHAMBERS, BROTHER & CO.,
52nd St., Below Lancaster Ave.,
PHILADELPHIA, PA.

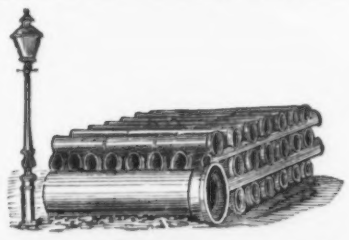
OXFORD
IRON AND NAIL CO.,
Cut Nails
AND
SPIKES.
J. S. SCRANTON, Sales Agent,
51, 53 and 55 Washington Street,
NEW YORK.

BURDEN'S
HORSE SHOES.
"Burden Best"
Iron
Boiler Rivets.
THE BURDEN IRON CO.
TROY, N. Y.

WILLIAM H. WALLACE & CO.,
Iron Merchants,
Cor. ALBANY & WASHINGTON STS.,
NEW YORK CITY.
Wm. H. Wallace. Wm. Bispham. E. C. Wallace.

DONALDSON IRON COMPANY
MANUFACTURERS OF


CAST IRON PIPE
And Special Castings for Water and Gas. Also, Flange Pipe
Emaus' Lehigh Co., Pa.


R. D. WOOD & CO.,
PHILADELPHIA
Manufacturers of
Cast Iron Pipe
FOR WATER AND GAS,
LAMP POSTS, VALVES, ETC.
Mathew's Pat. Anti-Freezing Hydrants.
400 CHESTNUT STREET.

John H. Ricketson, Prest. Wm. Holmes, Treas
A. G. Barnett, Sec'y.
A. GARRISON FOUNDRY CO.,
Manufacturers of Sand, Patent Homogeneous, Steel and
Chilled Rolls.
Ore and Clay Pulverizers, Rotary Squeezers, Haskin's Patent Double Spiral Pinions, and Rolling Mill Castings of every description.
Office, Nos. 10 & 12 WOOD ST., PITTSBURGH, PA.

CHAS. J. STEBBINS,
104 Reade St., New York,
STEEL AND IRON NAILS.

Bonnell, Botsford & Co.,
IRON, NAILS AND SPIKES
YOUNGSTOWN, OHIO.

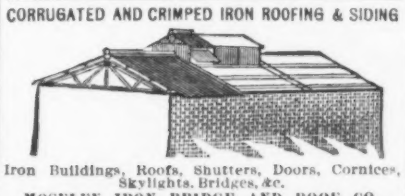
CONDIT, FULLER & CO.,
PIG IRON BAR
Cleveland, Ohio.

W. D. WOOD & CO., L'd,
PITTSBURGH, PA.

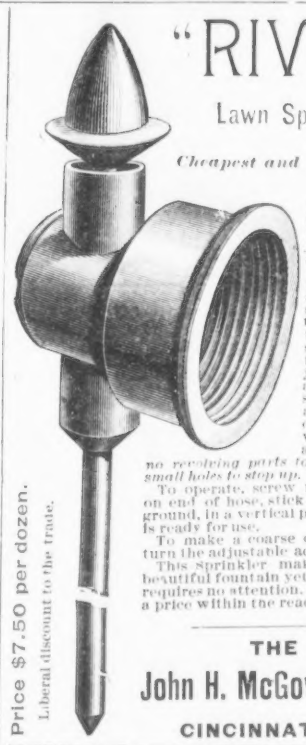
MANUFACTURERS OF PATENT
Planished Sheet Iron.
Patented April 8th, 1873; Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876; Oct. 17th, 1876; Jan. 11th, 1877; Feb. 6th, 1877; Dec. 10th, 1878; Jan. 10th, 1882; Jan. 1st, 1884; Feb. 12th, 1884; March 4th, 1884; Jan. 6th, 1885.
Guaranteed fully equal in all respects to the
IMPORTED RUSSIA IRON,
and at a less price.
ALSO
Common, Refined Charcoal and Juniata
GRADES OF
BLACK SHEET IRON.
Smooth on both sides.

EVERSON, HAMMOND & CO.
LIMITED
PITTSBURGH, PA.,
Sheet Steel
For Roofing and Corrugating.
OPEN-HEARTH STEEL, INGOTS and BILLETS.
SHEET IRON, All Grades.

Manhattan Rolling Mill.
J. LEONARD,
445 to 451 West St., 177 & 179 Bank St., NEW YORK
MANUFACTURER OF
HORSE SHOE IRON
Toe Calk Steel, Rods, Ovals, Half Ovals and Flats.

CORRUGATED AND CRIMPED IRON ROOFING & SIDING

Iron Buildings, Roofs, Shutters, Doors, Cornices, Skylights, Bridges, &c.
MOSELEY IRON BRIDGE AND ROOF CO.,
5 Dey Street, NEW YORK.

WM. McFARLAND,
Iron and Brass Founder,
TRENTON, N. J.
Chilled Cast Wire Dies a Specialty.
Any size or style made at short notice.


"RIVAL"
Lawn Sprinkler.
Cheapest and best in use.
The water from it covers an area of over 1000 square feet of lawn, and will work with a lower pressure than any other sprinkler in the world, the size of spray depending on the adjustment of acorn and pressure of water, also with sandy or muddy water as well as clear. It has no revolving parts to wear out or small holes to stop up.
To operate, screw the Sprinkler on end of hose, stick the rod into ground, in a vertical position, and is ready for use.
To make a coarse or fine spray turn the adjustable acorn on top.
This sprinkler makes the most beautiful fountain yet invented, requires no attention, and is sold a price within the reach of all.
Price $7.50 per dozen.
Liberal discount to the trade.
THE
John H. McGowan Co.,
CINCINNATI, O.

SYRACUSE
MALLEABLE IRON
WORKS,
SYRACUSE, - N. Y.
Mower and Reaper Castings and Carriage Irons a Specialty.
W. B. BURNS, PROPRIETOR.

HENRY KELLY,
PUBLIC ACCOUNTANT,
923 Walnut St., PHILADELPHIA, Pa.
Specialty: Iron and Steel Manufacturers' Cost Accounts and Partnership Settlements.
Late Chief Accountant to Cambria Iron Company.

E. JENCKES MANFG. CO.,
PAWTUCKET, R. I.,
Bright Wire Goods, Belt Hooks,
SPRING PINS, KEYS AND COTTERS.
Bent Wire Goods of all kinds a Specialty.
New York Office, 88 Chambers Street.
SAMUEL A. HAINES, Selling Agent

METAL AND RUBBER STAMPS,

steel figures and letters, name stamps, type for type writers, chilled-iron figures and letters, stamps for raising letters on wood or metal, branding irons, pattern letters, stencils, house numbers, metal-bodied rubber type, rubber stamps, &c. Send for free illustrated catalogue.
BELLOWS & DICKEY, 39 to 43 Viaduct St., Cleveland O

HOWARD, CHILDS & CO.,
IRON AND STEEL FACTORS
AND COMMISSION MERCHANTS,
HAMILTON BUILDING, PITTSBURGH, PA.
Iron and Steel of all Descriptions. Iron and Steel Nails, Heavy Hardware, Wrought and Cast Iron Pipe. Railway and Mine Equipment and Supplies. Plain and Barb Wire. Manufacturers' and Contractors' Supplies.

D. R. LEAN. T. S. BLAIR, JR.
LEAN & BLAIR,
Engineers and Contractors,
Room 709, Hamilton Building, Pittsburgh, Pa.,
will contract to erect, equip and place in operation Open-Hearth and Bessemer Steel Works, Blast Furnaces, Lash Steel Melting Furnaces, Hainsworth Soaking Pits, Fire-Brick Hot-Blast Stoves, Gas Works, &c.

THE ROBINSON-REA MFG. CO.,
PITTSBURGH, PA.
PLATE, OLD RAIL, MUCK SHEARS (No 2.)

RHODE ISLAND HORSE SHOE CO.,
MANUFACTURERS OF
Horse, Mule & Snow Shoes OF THE Perkins Pattern.
Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I.
F. W. CARPENTER, President. C. H. PERKINS, Gen'l Manager. R. W. COMSTOCK, Secretary

J. M. SCHOONMAKER COKE CO.
MANUFACTURER AND SHIPPER OF
CONNELLSVILLE COKE
Capacity of Mines, 2500 Tons Daily.
Siding connections with all lines of Railroads.
Office 120 Water Street, PITTSBURGH, PA.

HICKS & DICKEY, 413 Commerce St., Phila., Pa.
Iron, Steel and Forgings of every Description.
Machinery Steel in Bars, also cut to exact lengths. Crown Cast Tool Steel, Warranted. Special Quality Iron and Steel Shafting, with large assortment of heavy sizes on hand. Plate and Sheet Iron, Bolts, Nuts and Rivets. Hartman Steel Wire Nails. Steel and Iron Forgings of all kinds. Cold Rolled Steel Shafting.

PASSAIC ROLLING MILL CO.
Manufacture and have always in stock
ROLLED IRON BEAMS,
Channels, Angles, Tees, Merchant Bars, Riveted Work, Forgings, Eye Bars, &c.,
PATERSON, N. J.
Rooms 151 and 152, No. 45 Broadway, New York.

CUT NAILS,
Hot Pressed Nuts, Bolts, Washers, &c.
DOVER IRON CO.'S
Boiler Rivets, Boiler Brace Jaws, Socket Bolts,
BAR IRON.
FULLER BROTHERS & CO.,
139 GREENWICH ST., NEW YORK.

WILLIAM R. HART & CO.,

SPANISH, AFRICAN **IRON ORES** AND ITALIAN

CASTLE PIG IRON.
for Finest Steel (phosphorus uniformly low, seldom reaching .04 per cent., and Silicon from 1 per cent. upward, according to requirements of buyers).

MOHICAN PIG IRON.
A superior iron for ordinary Bessemer work, comparing favorably with English West Coast Hematites.

Bessemer, Basic and Open-Hearth Steel Slabs, Billets, Plates and Bars to specifications furnished
Old Iron and Steel Rails, Crop Ends, Spiegeleisen, Ferromanganese, &c.

226 Walnut Street, - - PHILADELPHIA.
PITTSBURGH OFFICE, 81 FOURTH AVE.

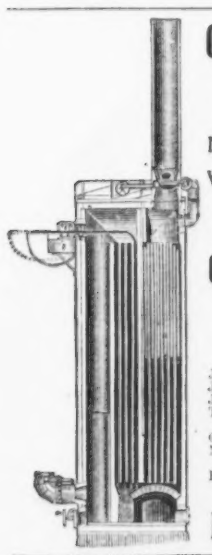
Cambria Steel.

STEEL RAILS, STANDARD AND LIGHT WEIGHTS.
STREET RAILS AND
RAILWAY FASTENINGS,
Bessemer and Open-Hearth Blooms, Billets and Bars,
Steel Axles, Steel Angles.
Steel Castings, Steel Forgings.
CAMBRIA IRON COMPANY,
Office, 218 S. Fourth St., Philadelphia. Works, Johnstown, Pa.

ALAN WOOD COMPANY,
MANUFACTURERS OF
Patent Planished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom
PLATE & SHEET IRON,
ALSO LIGHT PLATES AND SHEETS OF STEEL.
No. 519 Arch Street, Philadelphia, Pa.
Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack, Tank and Boat Iron; Last, Stamping, Ferrule Locomotive Headlight and Jacket Iron.

W. H. WALBAUM & CO.,
206 S. Fourth Street, Philadelphia.
NEW AND OLD RAILS. BLOOMS. BESSEMER PIG.
Crop Ends, Spiegeleisen, Iron Ores and Railroad Supplies Generally.
AGENTS IN THE UNITED STATES FOR
THE NORTH LONSDADE IRON & STEEL CO., Limited, Bessemer Pig Iron, brand "Ulverston;" Malleable Pig Iron, brand "U. H. M."
MOSS BAY HEMATITE IRON & STEEL CO., Limited, Spiegeleisen, Crop Ends, &c.
Also for "Lorn" Malleable Charcoal Pig Iron and N. B. ALLEN & CO.'S Dinas Fire Bricks.

PENCOYD IRON WORKS,
A. & P. ROBERTS & CO.,
—MANUFACTURERS OF—
BEAMS, CHANNELS, DECK BEAMS, ANGLES, TEES, PLATES, MERCHANT BAR.
Shafting and Rolled or Hammered Axles of Iron or Steel.
Office, No. 265 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

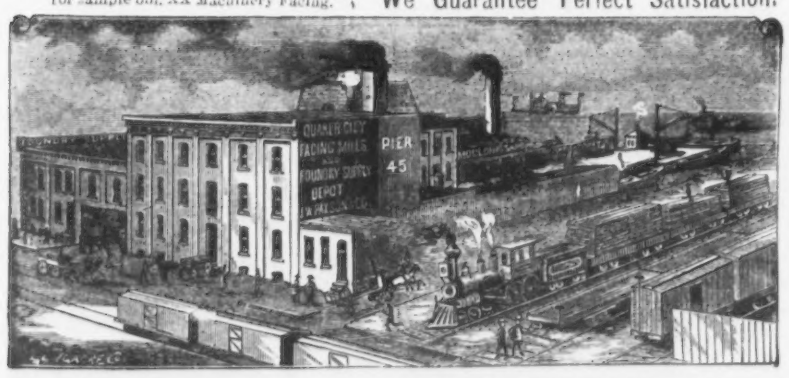


GORDON, STROBEL & LAUREAU, Limited,
Engineers and Constructors,
Main Office: No. 226 Walnut St., Philadelphia, Pa.
Works: Mifflin and Meadow Sts., Philadelphia, Pa.
Western Branch: PITTSBURGH, Pa. Southern Branch: NASHVILLE, TENN.
Gordon-Whitwell-Cowper Fire-Brick Hot-Blast Stoves.
We have contracted for the following Stoves, since their introduction one Year ago:

Jefferson Iron Works, Ohio	3 Stoves.	North Chicago R. M. Co., Ill.	3 Stoves
Joliet Iron & Steel Co., Ill.	4 "	Missouri Furnace Co., Mo.	2 "
Jupiter Furnace Co., Mo.	3 "	Western Steel Co., Mo.	3 "
Tenn. Coal, Iron & R. R. Co., Ala.	18 "	Cleveland Rolf. Mill Co., Ohio	4 "
Coleburg Coal & Coke Co., Ala	3 "	Belmont Nail Co., W. Va.	2 "
Nashville Charcoal Iron and Steel Co., Tenn.	4 "	Ala. & Tenn. Coal & Iron Co., Ala	9 "
Princess Furnace, Va.	4 "	Decatur Land, I. & I. Co., Ala.	2 "
		N. Y. & Perry Coal and Iron Co., Ohio	2
Total			60 stoves

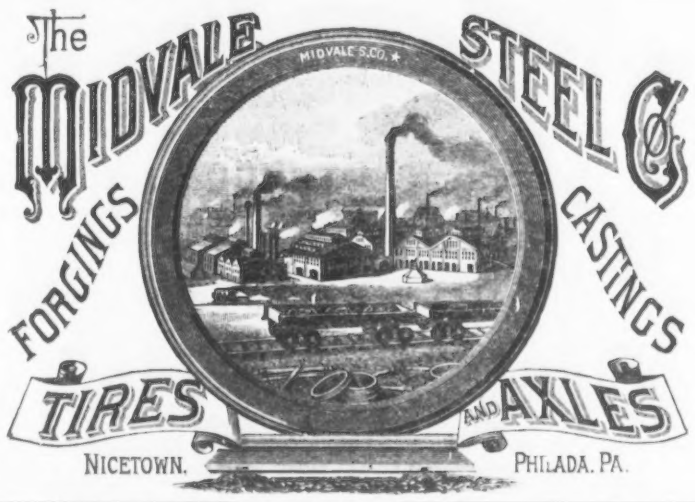
BLAST FURNACES AND STEEL WORKS.

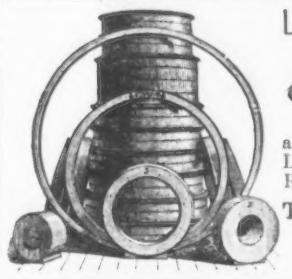
QUAKER CITY FACING MILLS.
For Sample Box (Coal) Stove Plate Facing. For Sample Box, Machinery Facing. We Guarantee Perfect Satisfaction.



RIDDLES, SHOVELS, BELLOWS, STEEL WIRE BRUSHES, BRISTLE BRUSHES,
And all other Tools used in a Foundry, of our Own Special Make.
J. W. PAXSON & CO.,
DEALERS IN MOULDING SAND, AND MANUFACTURERS OF FOUNDRY SUPPLIES,
Nos. 1015, 1017, 1019 and 1021, or Pier 45 North, Del. Ave., PHILADELPHIA, PA.

WAITE, VAN HARLINGEN & MACTIER,
ENGINEERS AND CONTRACTORS,
308 Walnut St., - - Philadelphia, Pa
Metallurgical Furnaces.
SPECIALTY: GAS REGENERATIVE FURNACES OF THE SIEMENS TYPE.
Steel, Heating, Puddling, Tube Welding, Zinc and Chemical Furnaces; also Glass Tank and Pot Furnaces.
Works Built Complete.





LOCOMOTIVE AND CAR-WHEEL TIRES
Manufactured from the celebrated OTIS STEEL BRAND
STANDARD
Quality and efficiency fully guaranteed. Prices as low as any of the same quality. We manufacture Heavy and Light Forgings, Driving and Car Axles, Crank Pins, Piston Rods, &c.
THE STANDARD STEEL WORKS,
WORKS AT LEWISTOWN, PA.
Office, 220 S. 4th St., Philadelphia, Pa.

The Phœnix Iron Co.,
410 WALNUT ST., PHILADELPHIA
Manufacturers of Wrought Iron
Beams, Deck Beams, Channels, Angle & Tee Bars,
STRAIGHT AND CURVED TO TEMPLATE,
Largely used in the construction of Iron Vessels, Buildings and Bridges.
Wrought Iron Roof Trusses, Girders and Joists, and all kinds of Iron Framing used in the construction of Fire-Proof Buildings: *Patent Wrought Iron Columns, Weldless Eye Bars,* and Built-up Shapes for Iron Bridges.
REFINED BAR, SHAFTING, and Every Variety of SHAPE IRON Made to order.
Plans and Specifications furnished. Address DAVID REEVES, President.
New York Agents, MILLIKEN, SMITH & CO., 61 Liberty St.
Boston Agents, HOUDLETTE & DUNNELS, 272 Franklin St.

The Allentown Rolling Mills,
MANUFACTURERS OF
Rails, Bars, Axles, Shafting, Fish Bars (Plain and Angle), Spikes, Rivets, Bolts and Nuts, &c., Bridges and Turn-Tables.
General Office, 237 South Third St., Philadelphia. Works at Allentown, Pa.
EDWARD CORNING, 15 Cortlandt St., New York, New York Sales Agent.

PLYMOUTH ROLLING MILL CO., Conshohocken, PA.,
MANUFACTURERS OF
Pig Iron, Foundry and Forge.
Puddled Bars, Special for Axles, Best Neutral and Common.
Plate and Sheet Steel, Every description of Light Plates and Sheets of Steel.
Plate and Sheet Iron, Best Bloom, Tube, Cleaned, Best Refined, Skelp, Blue Annealed and Common.
Particular attention given to Iron for Special Purposes.

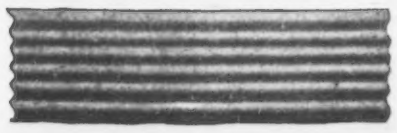
TESTED CHAINS.
Bradlee & Co., Empire Chain Works,
Beach & Otis Sts., Philadelphia.
Chains for Foundry Cranes and Slings.
"D. B. G." Special Crane Chain.
Steel and Iron Dredging, Slope and Mining Chains.
Ship's Cables and Marine Railway Chains.

CUMBERLAND NAIL AND IRON CO.,
MANUFACTURERS OF
"CUMBERLAND" NAILS & WROUGHT IRON PIPE,
43 North Water St., and 44 North Delaware Ave., PHILADELPHIA.

J. Tatnall Lea & Co.,
Successors to CABEEN & CO.,
IRON COMMISSION MERCHANTS,
No. 400 Chestnut Street, Philadelphia.
BESSEMER, MILL AND FOUNDRY PIG IRON, SKELP IRON, MUCK AND SCRAP BARS, NATIVE AND FOREIGN ORES. AGENTS FOR CONNELLSVILLE COKE.

BOOTH, GARRETT & BLAIR,
ANALYTICAL AND CONSULTING CHEMISTS,
919 and 921 Chant St. (10th St., above Chestnut St.), Philadelphia, Pa.
Established in 1836.
Analysis of Ores, Waters, Metals and Alloys of all kinds. A special departmen for the
ANALYSIS OF IRON AND STEEL,
fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron, Steel, Iron Ores, Slags, Limestones, Coals, Clays, Fire Sands, &c. Agents for sampling ores in New York and Baltimore. Price lists on application

129 & 131 So. Clinton St. KNISELY & MILLER, CHICAGO, ILLINOIS.
MANUFACTURERS OF
CORRUGATED IRON
Painted or Galvanized,



Straight or Curved.
THREE SIZES OF CORRUGATION.
We carry at all times a large stock from which we can fill orders promptly. *Send for Catalogue and Prices*

EDWARD J. ETTING,
IRON BROKER & COMMISSION MERCHANT
222 S. THIRD ST., PHILADELPHIA, PA.
PIG, BAR and RAILROAD IRON, OLD RAILS, SCRAP, &c.
Agent for the
Mount Savage Fire Brick.
Eastern Penna., West New Jersey and Delaware
AGENT FOR IRONDALE FURNACE, PRESTON COUNTY, W. VIRGINIA.
STORAGE YARD, Pier No. 57 Southfield Navy Yard) which is connecte with Penn. R. R. and its various connections. Negotiable Warehouse Receipts issued. CASH ADVANCES MADE ON IRON.

JUSTICE COX, JR. CHARLES K. BARNS.
JUSTICE COX, JR., & CO.,
AGENTS FOR
CATASAUQUA M'F'G. CO.,
Iron, Steel,
Bars, Boiler, Tank and Bridge Plates; Skelp Angles and Shapes; Charcoal, Montgomery Conewago and Alice Furnaces.
PIG IRON
for Foundries and Mills.
ERIE FORGE CO., LTD. Iron and Steel Forgings Every shape.
224 South Fourth Street, - Phila., Pa

Jerome Keeley & Co.,
206 Walnut Place, Phila.,
Selling Agents for CHARCOAL and ANTHRACITE BLOOMS, PIG IRON, BAR IRON, SHEET IRON, STEEL and IRON RAILS, IRON CLAD STEEL RAILS and BARS, MAGNETIC and HEMATITE IRON ORES, FIRE BRICK, COAL and COKE, MUCK BARS. Handle Old Iron and Steel Rails, Scrap Iron, &c. Examine and negotiate sales of Iron and Coal properties.

E. H. Wilson. A. Kaiser. J. B. M. Hirons
E. H. WILSON & CO.,
222 and 224 South Third St, Philadelphia,
BROKERS AND DEALERS IN
IRON AND STEEL.
Correspondence solicited.

J. W. HOFFMAN & CO.,
IRON COMMISSION MERCHANTS
208 South Fourth St., Philadelphia.
Selling Agents PINE IRON WORKS, Pine Brand Plates; GLASGOW IRON CO., Plates and Muck Bars; SPRANG STEEL & IRON CO. (Limited) Siemens Martin (Open Hearth) Steel, Universal and Sheared Plates, Angles and Shapes.

JNO. L. HOGAN,
IRON COMMISSION MERCHANT,
216 SOUTH FOURTH ST., PHILA.
Pig Iron & Ores, Steel & Iron Blooms
Agent for Brier Hill Iron and Coal Co., Youngstown Steel Co. Open Hearth Metal, Charcoal Iron, Connellsville Coke, Old Rails, Scrap, &c.

Andover Pig Iron FOR BEST MILL PRODUCTS. Andover Chill Iron for Carwheels, &c
Each Pig marked exact chill depth (⅛ in. to ⅞ in.), A. Whitney & Son's standard test.
F. A. COMLY, *Treas.*
J. WESLEY PULLMAN, *Agent.* 240 So. 3d St., Phila

NORTH BROTHERS MFG. CO.,
Iron Founders,
Light Castings a Specialty.
N. W. Cor. 23d and Race Streets'
PHILADELPHIA.
Correspondence solicited.

Established 1847.
A. WHITNEY & SONS,
CAR WHEEL WORKS,
PHILADELPHIA.
Special Wheels for Furnace and Mine Cars.

J. J. MOHR,
430 WALNUT ST., PHILA., PA.,
SOLE AGENT FOR
Sheridan, Leesport, Temple, Lynchburg, Millcreek and Mt. Laurel
Foundry PIG IRON and Forge
CHARCOAL PIG IRON.
Also Woodbridge Clay Mining Co.'s Fire Brick.

JAS. G. LINDSAY. THOS. S. PARVIN
LINDSAY, PARVIN & CO.,
328 Walnut St., Phila.,
Iron and Steel Structural Material
FOR ALL PURPOSES.
Estimates furnished for Iron and Steel Structures and Railway construction. Correspondence solicited with railroad contractors.

L. & R. WISTER & CO.,
IRON COMMISSION MERCHANTS,
257 So. 4th St., Philadelphia.
AGENTS
Kemble and Norway Foundry and Forge Pig Iron. Wyebrooke C. B. Charcoal Pig Iron. Ferguson Red Short Pig Iron.
DEALERS IN ALL KINDS OF SCRAP IRON.

MORRIS, WHEELER & CO.
Iron, Steel and Nails.
WAREHOUSE & OFFICES, 16th & Market Sts., PHILA., PA. | SALES OFFICES, 400 Chestnut St. PHILA., PA.
New York Address, 14 CLIFF ST.

HENRY LEVIS & CO.,
Manufacturers' Agents
For Iron and Steel Rails, Car Wheels, Boiler and Sheet Iron and General Railway Equipments.
Old Rails, Axles and Wheels bought and sold.
234 S. 4th St., Philadelphia.

Frank K. Esherick Barclay W. Cotton.
ESHERICK & CO.,
263 So. 4th ST. PHILADELPHIA
Iron and Steel of All Description.
Selling Agents for Cleveland City Forge and Iron Co., Forgings; Central Iron and Steel Works, Plates of Iron and Steel; Danville Nail and Mfg. Co., Iron and Steel Nails, Boiler Tubes; Bridge, Car and Boat Specifications a Specialty.

ESTABLISHED IN 1848.

SINGER, NIMICK & CO., LTD.,

PITTSBURGH, PA.,

MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

STEEL,

WARRANTED EQUAL TO ANY PRODUCED.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke-Stacks, Tanks, &c.

☞ All our Plate and Sheet Steel being rolled by a Patented Improvement, is unequaled for surface finish and exactness of gauge.

ROUND MACHINERY CAST STEEL

For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Plow Steel.

ron Center" Cast Plow Steel.
oft Steel Center" Cast Plow Steel.
lid Soft Center" Cast Plow Steel.

Finished Rolling Plow Coulters, with Patent Screw Hubs attached. Agricultural Steel cut to any pattern desired. Steel Forgings made to order.

Represented a 243 Pearl and 18 Cliff Sts., New York, by

HOGAN & SON, General Agents for Eastern and New England States.

HOGAN & McCARGO, 417 Commerce St., Philadelphia, and FULLER, DANA & FITZ, 110 North St., Boston.

Moorhead McCleane Company,

Soho Mills, Pittsburgh, Pa., U. S. A.

MANUFACTURERS OF

SHIP, TANK AND BRIDGE PLATE, SKELP SHEET IRONS, Special Sizes. AND WIDE SHEETS.

Iron, Steel or COMPOUND ARMOR PLATES, UP TO 18 INCHES THICK. GUARANTEED TO STAND ADMIRALTY TESTS. STEEL OR IRON PLATES FOR MERCHANT VESSELS OR YACHTS.

Galvanized Sheets (Patent Leveled). Only Manufacturers And PLANET Brands.

SOHO CHB TRADE MARK

Open Hearth Steel.

SHIP PLATE. TANK, BOILER, FLANGE and FIRE-BOX.

FRANKFORD STEEL COMPANY

FRANKFORD, PHILA., PA.,

STEEL RAILROAD AND MACHINE FORGINGS

SOLID CRUCIBLE STEEL CASTINGS AND Best Grades of Tool and Machinery Steel.

GEORGE BROOKE, President. GEO. W. HARRISON, Treasurer.

THE E. & G. BROOKE IRON CO.,

BIRDSBORO, BERKS CO. PA.,

MANUFACTURERS OF

ANCHOR NAILS AND SPIKES. BRAND

Capacity, 1000 Kegs per Day.

Made from their own Pig Iron, insuring Regularity and Superiority in Qual'ty.

ALSO

FOUNDRY AND FORGE PIG IRON,

AND COLD BLAST CHARCOAL CAR WHEEL IRON.

OLD DOMINION

CUT NAILS, BAR IRON.

R. E. BLANKENSHIP, President.

RICHMOND, VA.

NOW BUILDING A TWO-CONVERTER BESSEMER STEEL PLANT.

GANTENBERG'S

Domestic Sash Lock and Fastener

B. GANTENBERG, 64 Pike St., Covington, Ky.

Plain Sash Lock

The Domestic Sash Lock is perfectly burglar proof. It will keep the sash from rattling and is easily applied; made of the best material nickel plated. In two styles for lip or plain sash. To lock, press the knob of lock and turn it to the right; to unlock, turn to the left. It can be locked at any given point. See next insertion for Lip Sash Lock.

Write for circular, with discounts to the trade.

TACKS & WIRE NAILS,

BOAT NAILS,

Regular and Chisel Pointed: Black and Galvanized.

SHOE NAILS, &c. &c.

Lining and Saddle Nails, 3d. Fine Lath Nails.

BOSTON SALESROOM, 70 Portland St. BALTIMORE SALESROOM, 32 Light St. CINCINNATI SALESROOM, 349 Main St. NEW YORK SALESROOM, 116 Chambers St.

AMERICAN TACK CO., FAIRHAVEN, MASS.

Established - - - 1861.

THOMAS C. BURROWS,

Agent for Jersey City Steel Company,
Successors to JAS. R. THOMPSON & Co.

Manufacturers of **STEEL** Of All Descriptions.

WAREHOUSE, 99 and 101 JOHN ST., NEW YORK.

TERRE HAUTE IRON AND NAIL WORKS

TERRE HAUTE, IND.

Manufacturers of IRON and STEEL NAILS.

Reed & Prince, Worcester, Mass.,

MANUFACTURERS OF BLACK AND TINNED NORWAY IRON

RIVETS AND BURRS

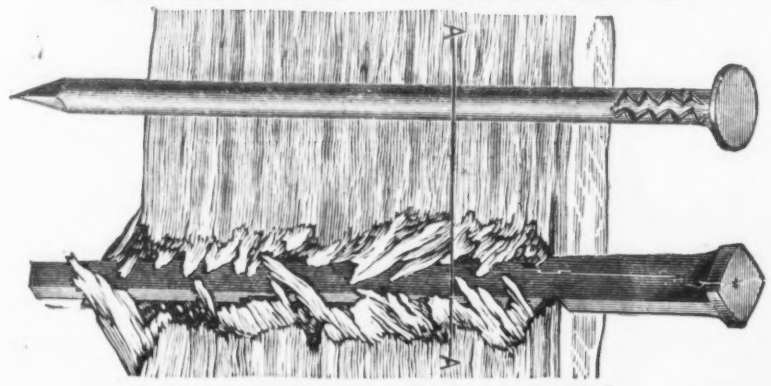
of Best Quality and Finish. Prices on Application.

THE SALEM WIRE NAIL CO.,

SALEM, OHIO,

—MANUFACTURERS OF—

WIRE NAILS.



The above Cut represents the Effect on Wood of a Cut Nail and a pointed Steel Wire Nail.

W. S. ESTEY,

No. 71 FULTON ST., NEW YORK.

Sifting Machine.

WIRE Cloths Work

MANUFACTURER OF

Of Brass, Copper, Iron, Galvanized and Steel Wire of all Meshes and Grades. For Mining, Milling and all other purposes. Locomotive Spark Wire Cloth, &c. For Bank, Office and Counter Railing, Store Fronts, Window Guards, &c.

Decoy Rat Trap.

Galvanized Wire Cloth for Protecting Windows, Sky Lights, &c.

WIRE CLOTH FOR SUGAR REFINERIES. GERMAN CLOTH FOR CENTRIFUGAL MACHINES

Coal and Sand Screens. Riddles for Export and Foundry Use. Galvanized Twist Netting for Fencing, Henneries, Trellises, &c. Wire Window Screens.

IRON BOLTING CLOTH. SILK BOLTING CLOTH.

Wire Work and Wire Goods of Every Description.

Inverted—Showing Clamps.

S T PATENT SIFTER.

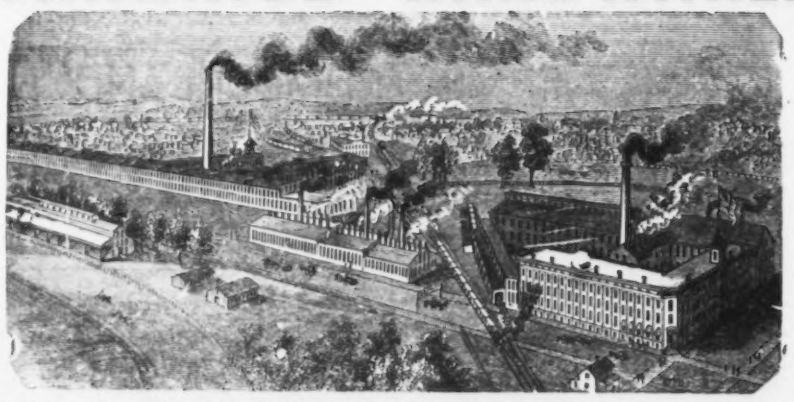
S T PATENT RAT TRAPS.

Oliver's Patent Decoy Rat Traps.

S. T. PAT. ADJUSTABLE FOUNDRY RIDDLES.

Showing Different Parts.

CARRIAGE HARDWARE.

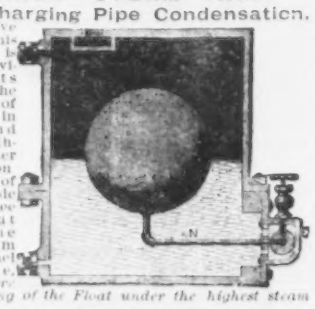


THE E. D. CLAPP MFG. CO., Auburn, N. Y

EDWARDS' STEAM TRAP

For Discharging Pipe Condensation.

The positive action of this Float Trap is the best evidence of its efficiency. The Float is made of Cast Brass, in halves, and screwed together. The water from the condensation of moisture inside the Float is free to pass out through the tubular stem and the channel in the valve, therefore *there is no collapsing of the Float under the highest steam pressure.*



AMOS ALLER, 109 LIBERTY ST., N. Y.

Automatic Cellar Drainer,

For Removing Water from Cellars, Excavations, Wheel Pits and other places where water accumulates through defective drainage, occasional floods or high tides.

This Machine is entirely automatic and will elevate water to a height according to whatever water pressure is available. Its operation is simple, for when in position, the rising of the water will lift the float which opens the valve and the action of the pressure water will discharge the contents from Cellars or Pit, when the float will fall and shut off the pressure water. The suction valve at bottom of machine effectually prevents any pressure water from getting into cellar in case of insufficient pressure from water mains. Larger sizes to order.

Price of Drainer, $12.00 Automatic Attachment, $20.00.

A. ALLER, 109 Liberty St., New York.

THE BABCOCK & WILCOX CO.,

WATER TUBE STEAM BOILERS.

107 Hope Street GLASGOW.

30 Cortlandt Street, NEW YORK.

BRANCH OFFICES

BOSTON, 65 Oliver Street.
PHILADELPHIA, 32 N. 5th Street.
LONDON, 114 Newgate St.
CHICAGO, 64 S. Canal Street.
NEW ORLEANS, 57 Carondelet St.
SAN FRANCISCO, 561 Mission St.
HAVANA, 50 San Ignacio.
CITY OF MEXICO, Calle del Seminario No. 6.

Send to Nearest Office for Circular.

WROUGHT IRON

BOILER TUBES.

Steam, Gas and Water Pipe, Oil Well Tubing, Casing AND

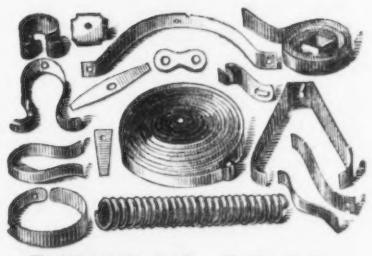
LINE PIPE.

Cotton Presses, Forgings, Rolling Mill and General Machinery.

READING IRON WORKS.

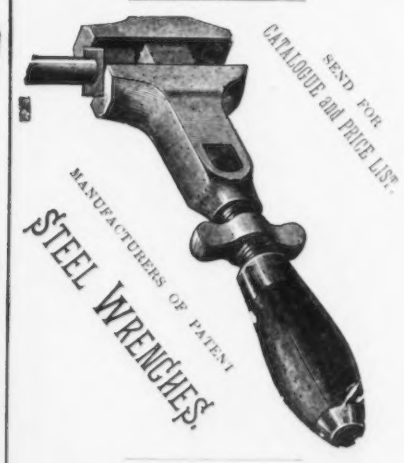
261 S. Fourth St., Philadelphia.

FRANKLIN S. MILES, Manufacturer of Brass, Iron, Steel and German Silver SCREWS, 205 Quarry St., Philadelphia.



DUNBAR BROS., Manufacturers of Clock Springs and Small Springs of every description, from best Cast Steel. BRISTOL, CONN.

DIAMOND WRENCH CO.

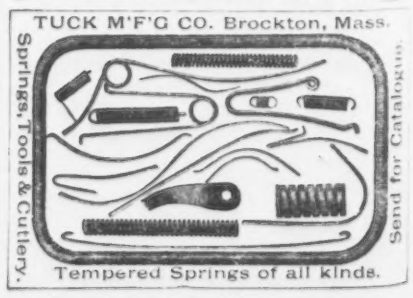


PORTLAND, MAINE.

No. 1	Plumbago Babbit	30 cts. lbs	Delivered
No. 2	Plumbago Babbit	25 cts. lbs.	
No. 3	Plumbago Babbit	16 cts. lbs.	
No. 4	Plumbago Babbit	14 cts. lbs.	

AGENTS WANTED. LIBERAL DISCOUNTS.

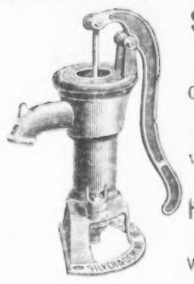
TUCK M'F'G CO. Brockton, Mass.



Springs, Tools & Cutlery. Send for Catalogue.

Tempered Springs of all kinds.

SILVER & DEMING MANUFG. CO.,



Salem, Ohio
U. S. A.,

MANUFACTURERS OF
CISTERN, PITCHER, WELL and FORCE
PUMPS
Wind Mill Pumps, Hand and Power Rotary Pumps,
HYDRAULIC RAMS,
Boiler Feed Pumps, Garden Engines, &c.
Write for Catalogue and Prices

AGENCIES

ENGLISH BROS., Kansas City, Mo.; PANCOAST & MAULE, Phila., Pa.; LOUIS WAEFELAER CO., LIMITED, 81 Beekman Street, New York.

EUROPEAN AGENCY,

SELIG, SONNENTHAL & CO., London E. C., England.

GLASS The most perfect and non-corrosive valve seat, used only in Myers' Pumps.

MYERS' FORCE-PUMP

Adapted to open and drilled wells. The only double acting force-pumps furnished with expansive plunger bucket and **Glass Valve-Seat. The only successful Drill Well Pump made.**

Simple, durable, powerful, easy to operate. **Never affected by frost.**

MYERS' DOUBLE LOCK REVERSIBLE HAY CARRIER.

A perfect reversible carrier. New Myers' iron, steel and wood track carriers. The simplest carriers made. Double and single harpoon hay forks, pulleys grapplers, sling attachments, grapple hay forks, door and hanging hooks, etc.

Illust'd Catalogue FREE

F. E. MYERS & BRO., ASHLAND, O.

JOHN MAXWELL,

MANUFACTURER OF PATENTED

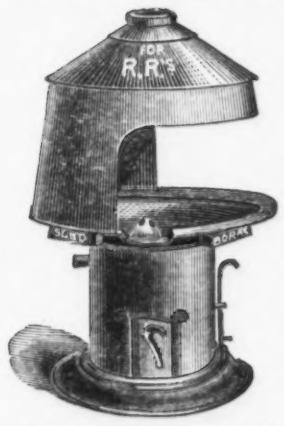
BRASS, BRIGHT TINNED WIRE & JAPANNED
BIRD CAGES.

The cheapest and most saleable in market.
Catalogues and Price Lists furnished to the Trade.

247 & 249 Pearl St.
New York.

Full size of Band for Brass and Tinned Wire Cages.

Patterson's Patent Forges



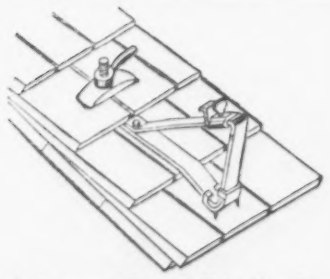
SEVEN SIZES.

Send for Catalogue and Price List.

BROWN & PATTERSON, Marcy Ave. and Hope Street,
BROOKLYN, N. Y.

WALKLEY HARDWARE CO., PLANTSVILLE, CONN., are putting up special brands of Steel Carpet Tacks in an original form. Something new and attractive combined with good quality and correct price. Send for photograph of latest novelty.

ENTERPRISE BOILER CO.,
MANUFACTURERS OF
Steam Boilers, Sheet Iron
AND PLATE WORK OF ALL DESCRIPTIONS,
YOUNGSTOWN, OHIO.



Ryan's Improved Patent Shingling Bracket

BEST AND SAFEST BRACKET MADE.

Endorsed by all who have occasion to go upon roofs. Can be ATTACHED INSTANTLY to any roof. Made of best wrought iron, and warranted strong and durable. Fastened to the roof by inserting under the shingles and clamped. No nails used. When once fastened cannot slip or tear the shingle. Address

P. W. RYAN, Box 261, Marlboro, Mass.

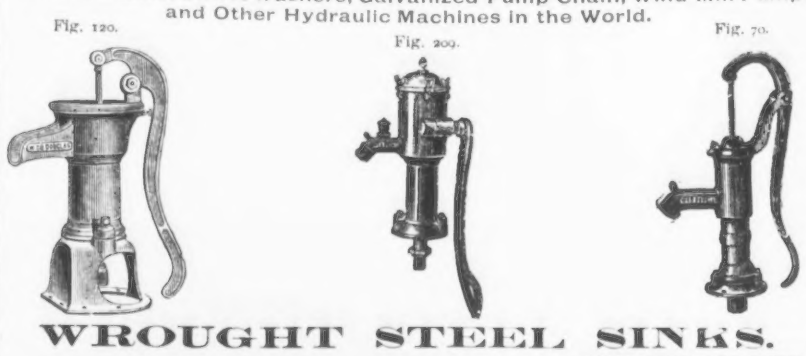
W. & B. DOUGLAS, Middletown, Conn.,

The Oldest and Most Extensive Manufacturers of

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and Other Hydraulic Machines in the World.

Fig. 120. Fig. 209. Fig. 70.



WROUGHT STEEL SINKS.

One of the strong points of these sinks is the new coupling with which they are now supplied, and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.

The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

BRANCH WAREHOUSES:

85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.

UNION MANUFACTURING CO.,

MANUFACTURERS OF ALL STYLES

Plain and Ornamental Butts,

LOOSE PIN REVERSIBLE, CAST FAST AND LOOSE,

Drilled and Wire Jointed, Japanned, Figured Enameled, Nickel Plated and Real Bronze Butts.

Also a Full Line of

IRON AND BRASS PUMPS,

Cistern, Well and Force Pumps, Yard Drive Well, Garden Engine and Steam Boiler Pumps, Hydraulic Rams, &c., and all with the most modern improvements.

UNION SPIRAL SPRING HINGES.

We beg to call the attention of Architects, Builders, Dealers, and all interested parties, to our Spiral Spring Hinge, knowing it to be an effectual and durable one, neat in appearance, easy to put on, and not liable to get out of order. The Springs are made from wire made expressly for us and for this particular purpose, with the view of great elasticity, durability and power. They produce a continuance pressure from the point where the door is wide open until it is closed, and then hold it perfectly in position. It has a solid pintal in connection with short hollow ones, causing little or no friction, the whole power of the Spring being exerted in swinging the door. It is Fast Joint, and can be used for either right or left hand, allowing the dealer to carry less stock, and the builder will never get the wrong hand.

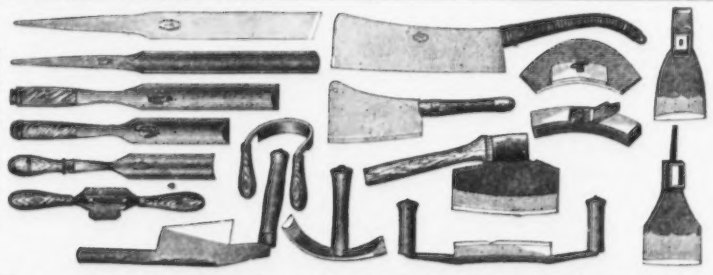
☞ FINE CASTINGS A SPECIALTY.

New Britain, - Connecticut.

Warehouse: 103 Chambers Street, New York.

Illustrated Catalogue and Price List furnished upon application.

ESTABLISHED 1837.



L. & I. J. WHITE, MANUFACTURERS OF EDGE TOOLS,

BUFFALO, N. Y.

Coopers', Carpenters' and Ship Tools, Plane Irons, Cleavers, &c. Full Line Chisels.

HARRINGTON & RICHARDSON'S

New Automatic Double-Action REVOLVER.

.32 and .38-cal., Central Fire, Nickel Plated, Rubber Stock, Simple, Effective, Reliable. Sold everywhere by the Gun and Hardware Trade. Ask your Dealers for them, Manufactured by

HARRINGTON & RICHARDSON, - Worcester, Mass.

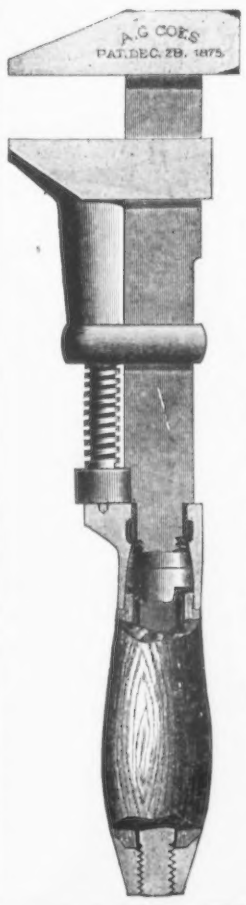
JOHN S. FRAY & CO., BRIDGEPORT, CONN., U. S. A.

Spofford Bit Brace. **Spofford Sleeve Brace.**

The Spofford Bit Brace is made under Letters Patent of the U. S. A., granted to N. Spofford, March 23, 1880 assigned to John S. Fray & Co.

All Iron, Five Sizes.	Cocobolo Head and Handle, Nickel Plated.	Sleeve Brace, Nickel Plated.
No. 7 ..... 7 inch sweep.	No. 107 ..... 7 inch sweep.	No. 70 ..... 7 inch sweep.
No. 8 ..... 8 "	No. 108 ..... 8 "	No. 80 ..... 8 "
No. 10 ..... 10 "	No. 110 ..... 10 "	No. 100 ..... 10 "
No. 12 ..... 12 "	No. 112 ..... 12 "	No. 120 12
No. 14 14	No. 114 ..... 14 "	

Established in 1839.



A. G. Coes & Co.,

WORCESTER, MASS.,

MANUFACTURERS OF

A. G. COES'
PATENT
SCREW WRENCHES,

The Strongest Wrench made, and the only successful re-enforced bar.

The Ferrule is firmly secured in place by a nut screwed on the bar.

Particular attention is called to the way in which the handle is made and fastened to the shank.

This Handle is made better and stronger than heretofore by using our new Cup Tip at the end which encloses the wood and keeps it from splitting. This is the only wrench which has the wood handle firmly secured and held together at each end, and it will stand more rough usage and last longer than any now made. It is not affected by heat, cold or moisture.

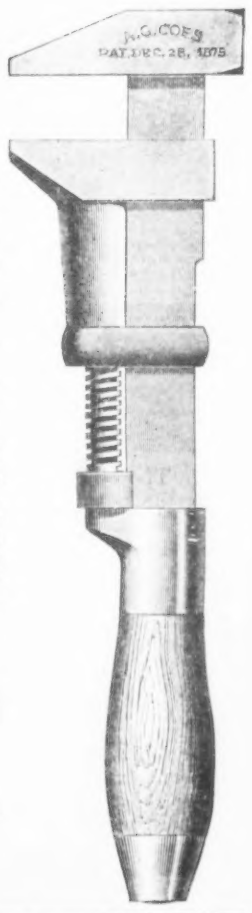
None Genuine unless Stamped,

A. G. COES & CO.

Warehouse:

113 Chambers and 95 Reade Sts.,
NEW YORK.

JOHN H. GRAHAM & CO., Agts.



Bemis & Call Hardware & Tool Co.

PATENT COMBINATION WRENCH.

Case-Hardened Throughout. Parts Interchangeable.

This Wrench can be Furnished with Long Nut or Sleeve

This Wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

No. 3 PATENT PIPE WRENCH.

The serrated jaws of the Wrench are interchangeable; that is, the same serrated plate may be used for either the stationary or sliding jaw, so that if one plate is broken another can be furnished adapted to either jaw without express designation. The slides, nuts and various parts are also interchangeable, thus easily repairing the Wrench at very small expense, and with as perfect practicability for further use as when the Wrench was new.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL COMPANY Springfield, Mass.

ACME WRENCH.

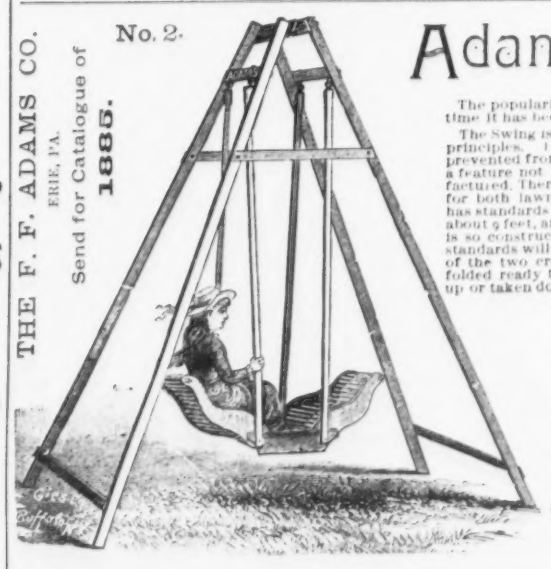
MANUFACTURED ONLY BY

GEO. W. MARBLE,
28 to 32 South Canal St., CHICAGO.

Write for Prices and Discounts.

THE F. F. ADAMS CO.
ERIE, PA.
Send for Catalogue of
1885.

No. 2.



Adams Swing.

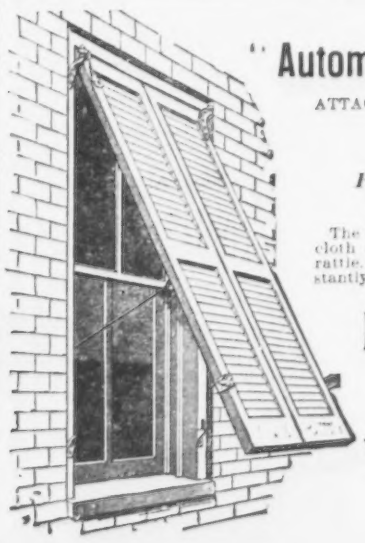
The popularity of the Adams Swing in the short time it has been introduced is phenomenal.

The Swing is constructed on original mechanical principles. The frame is so interlocked as to be prevented from sagging, even if the bolts are loose, a feature not possessed by any other swing manufactured. There are two sizes manufactured, adapted for both lawn and parlor. No. 1, or largest size has standards 9 feet 10 inches long, with a spread of about 9 feet, and 5 feet in width. The frame work is so constructed that by taking out two bolts the standards will close up, and by taking out the bolts of the two cross pieces the frame can be closely folded ready for shipping. The Swing can be put up or taken down ready for packing in 15 minutes.

The weight of the Swing is a little less than 100 pounds. It is very strong, having been tested by four men whose weight aggregated over 800 pounds.

The No. 2, or parlor size, has standards about 7 feet long, and otherwise proportioned in size, weighting less than 75 pounds. They combine simplicity of construction, beauty and strength, and can be operated with ease by small children in the swing.

For Sale by all Leading Dealers.



THE
"Automatic" Blind Awning Fixture.

ATTACHABLE TO OLD AS WELL AS NEW BLINDS ON FRAME OR BRICK HOUSES.

For Sale by all the Hardware Trade.

The very best Blind Hinge and a perfect Awning Fixture. No cloth to tear and wear out. No iron frames to shake and rattle. Blinds instantly converted to awnings. Awnings instantly converted to blinds.

F. O. NORTH & CO.,

SOLE MANUFACTURERS,
BOSTON, MASS.

W. H. Jacobus & Co.,
90 CHAMBERS ST.,
New York Warehouse.

Paris, 1878. *For Superiority.*

McCAFFREY & BRO.,

PENNSYLVANIA FILE WORKS,

PHILADELPHIA, PA., U. S.

Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim speci. advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

The object of this Diamond Point can be readily seen, in that it prevents the Set from slipping from the head of the nail while in use, thus saving in many cases some valuable piece of work.

IT IS FAST TAKING THE PLACE OF EVERY OTHER NAIL SET. ONCE SEEN MECHANICS WILL HAVE NO OTHER.

These Sets are carefully made from the BEST QUALITY OF TOOL STEEL. The Points are turned and thoroughly tempered, and will not break off.

EACH SET FULLY WARRANTED.

The Trade Supplied. Put up in Boxes ½ Dozen, 1 Dozen, ¼ GROSS and 1 GROSS. Assorted Sizes.

Prices and Terms upon application.

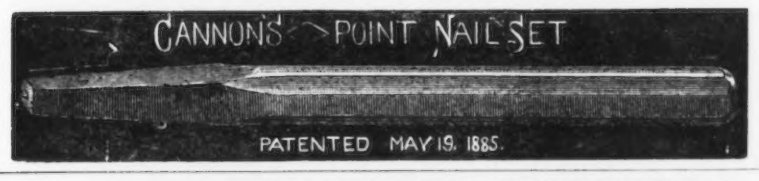
MANUFACTURED ONLY BY

THE EDWARD STORM SPRING CO., Limited,

JOHN H. GRAHAM & CO.,

Sole Manufacturers' Agents,

113 CHAMBERS ST., NEW YORK CITY.



LIGHTNING HAY KNIVES

WEYMOUTH'S PATENT.

This Knife is the **BEST IN USE** for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat & ditching marshes. The blade is **Best Cast Steel**, spring temper, easily sharpened, and is giving *universal* satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives. They are nicely packed in boxes, 1 dozen each of 60 pounds weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

HIRAM HOLT & CO. **EAST WILTON, Franklin Co., MAINE.**
For sale by the Hardware trade generally.

CAUTION.

We are informed that various parties are infringing upon the widely-known Letters Patent granted originally to GEORGE F. WEYMOUTH for an improved Hay Knife. The invention patented to GEORGE F. WEYMOUTH is embodied in a sword-shaped blade provided with operating handles for working the same, the edge of the sword-blade being furnished with knife-edged serrations or teeth. ☞ **It is our purpose to PROSECUTE ALL INFRINGEMENTS,** and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits are now pending in the U. S. Courts. ☞ **All manufacturers and dealers are hereby warned** of our rights, and **the public are cautioned** against purchasing any Hay Knives, made as described above, which are not of our *genuine* manufacture.

EAST WILTON, Sept. 1, 1886.

North Wayne Tool Co.,

HALLOWELL, MAINE,

W.H. CARTER'S PATENT NEEDLE HAY KNIFE.
PAT. APR. 29, 1884.
IMPROVED BY M.M. BARTLETT.
Improvement Patented April 28, 1885.

SOLE MANUFRS. OF Carter's Improved **NEEDLE HAY KNIFE,** THE BEST IN THE WORLD.

Patented April 29, 1884.

Improvement patented April 28, 1885, of which we are the sole manufacturers, has been tested with the most celebrated knives of other makers, and has proved an easier and faster Cutter than any other. Its special excellence consists in the chisel-edge tooth shown in the engraving. It may be used for cutting hay in the mow, stack and bale; also for ditching, cutting peat, or any other work for which a hay knife is used. It can be readily ground by the most inexperienced, as it requires to be ground only on one side. Should a tooth break, all that is necessary to replace the damage is to grind it once and a new chisel-tooth appears. It can ordinarily be sharpened with a common scythe stone. Try one and you will give it the preference.

THE EDDY ELECTRIC MFG. CO.

(Successors to A. H. EDDY),

42 UNION PLACE, OPPOSITE THE DEPOT, - - HARTFORD, CONN.,

MANUFACTURERS OF

THE MATHER

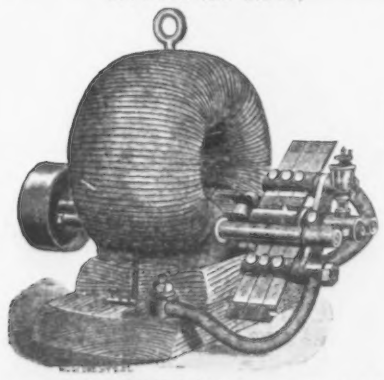
Dynamo-Electric Machine

— FOR —

Electro-Plating,

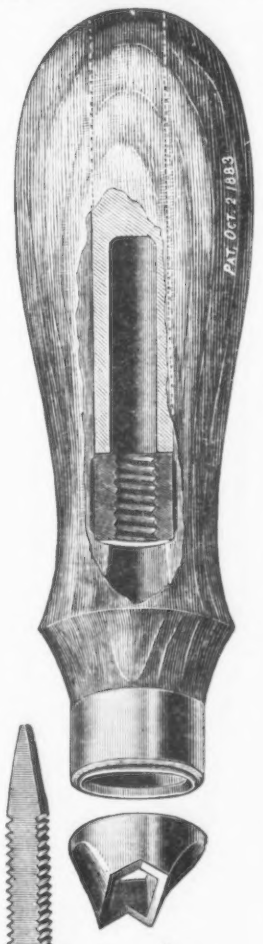
Electrotyping,

COPPER REFINING, &c.



NO REVERSING. NO WATER. NO NOISE. NO SPARK.

SATISFACTION GUARANTEED. *SEND FOR CIRCULAR.*



As a guarantee of the superior quality of Screw Tang Files over all others for any that are unsatisfactory as to temper, &c., we will give in exchange two for each one that is returned to us. One Handle will last a lifetime in constant use, making it the cheapest Handle in the World. Cost 10 cents each.

'GILBERT PARKER, President.

J. BARTON SMITH COMPANY,

PHILADELPHIA, PA., U. S. A.

ESTABLISHED 1842.

BLACK DIAMOND FILE WORKS.

G. & H. BARNETT,

21 to 43 RICHMOND STREET, - - - PHILADELPHIA.

CHARLES B. PAUL, MANUFACTURER OF HAND CUT FILES

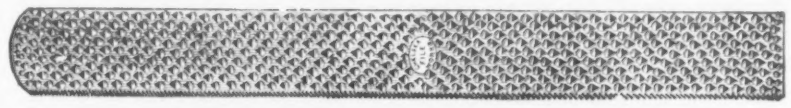
Warranted Cast Steel. 467 Keap St., Brooklyn, N. Y

All descriptions of Files made to order. Price List mailed on application. Established 1863.

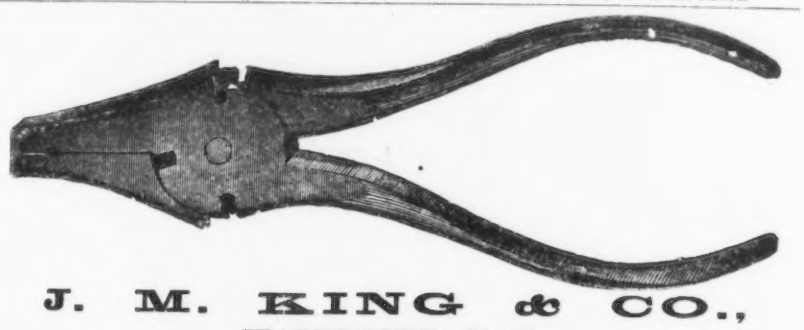
EXCLUSIVELY HAND-CUT FILES AND RASPS,

MANUFACTURED BY THE

CHELSEA FILE WORKS, NORWICH, CONN.



The superiority of our Horse Rasps over all others is universally admitted by those who use them, a their high degree of excellence will be scrupulously maintained. Give them a trial, and use no others.



J. M. KING & CO.,

WATERFORD, N. Y.

Manufacturers of the

Button's Pat. Wire Cutter and Plier Combined.

Specially Adapted for Use on Wire Fence.

Also Manufacturers of BLACKSMITHS' and MACHINISTS' STOCKS and DIES, PLUG and TAPER TAPS, HAND, NUT and SCREW TAPS, PIPE TAPS and REAMERS.

Price List on Application. Established by DANIEL B. KING, 1829.

NEW LONDON SCYTHE CO., SCYTHEVILLE, N. H., U.S.A.

MANUFACTURERS OF

THE GEM HAY KNIFE.

Patented July 29th, 1875.

We desire to call especial attention to our patent "Gem" Hay Knives, which are rapidly gaining in favor with the public. They are made from the best Cast Steel, tempered in oil, and their peculiar construction enables the user to do the work with greater ease and rapidity than with any other knife.

Send for Descriptive Circular and Price List.

LIGGETT SPRING AND AXLE CO., LIMITED,

MANUFACTURERS OF

Springs and Axles

For Coaches, Phaetons, Buggies, Wagons, &c

PITTSBURGH, PA.

The Williams Printing Company,

5, 7 and 9 Elm St.,

NEW YORK.

General . Book . Job . and . Commercial . Printers

Estimates Furnished For all Classes of Work.

GOOD WORK. FULL COUNT. FAIR PRICES.

Railroad and Warehouse Trucks of all sizes and descriptions.

RIEHLÉ BROS.

STANDARD

SCALES AND TESTING MACHINES

Phila., 50 So. Fourth St.
New York, 115 Liberty St.

AGENTS

Howard Childs & Co., Lewis Block, Pittsburgh

C. I. Wickersham, 167 Lake St., Chicago

Tests of Materials made daily at the Works, and certificates furnished. Reports copied and kept confidential.

GARRY IRON ROOFING COMPANY

Largest manufacturers of Iron Roofing in the world. Manufacturers of all kinds of

IRON ROOFING

Crimped and Corrugated Siding, Iron Tile or Shingle, Fire-Proof Doors, Shutters, &c.

IRON ORE PAINT AND CEMENT.

152-158 MERWIN STREET, CLEVELAND, O.

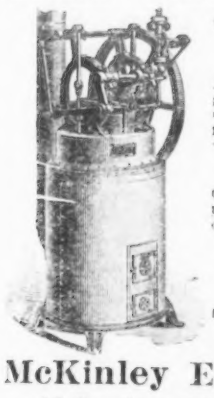
Send for Circular and Price List No. 15.

THE
Favorite Family Scale.

Light, Compact, Durable and Convenient.

This excellent Scale for family use is manufactured only by
JOHN CHATILLON & SONS,
85, 87 and 89 CLIFF ST., NEW YORK.
Also Makers of other
SCALES and BUTCHERS' TOOLS.

McKINLEY PATENT
AIR ENGINE.



The Best and Cheapest on the Market.

No Steam. No Water. Absolute Safety. No Engineer. No Pumps. No Gauges. No Liability to freeze up. No Regulation required.

NO EXTRA INSURANCE.

Can be used for any purpose where power is required.

Cheap Fuel. Cheap First Cost.

For further information, references, prices, &c., call or address

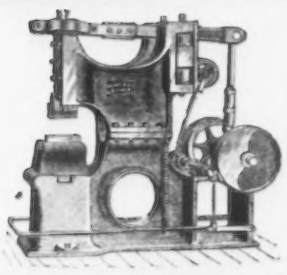
McKinley Engine Co.,
17 Broadway, Cincinnati, Ohio.

General Eastern Office and Salesroom, 21 South Third St., Philadelphia, Pa. Name this Paper.

PYROMETERS
FOR
Blast Furnaces, Bakers' Ovens, Roller Flues, Superheated Steam, Oil Stills, Zinc and Lead Baths, also,
REVOLUTION INDICATORS,
Which constantly indicate, without the use of a watch, the number of turns per minute made by a Steam Engine. Made under the patents of
EDWARD BROWN, 311 Walnut St., Philadelphia.
—ESTABLISHED 1860.—

J. M. STUTZMAN,
181 William St., New York.
Manufacturer of
Steel Alphabets
DIE LETTERS FOR SEAL ENGRAVERS,
BRANDS, SEALS,
POST-OFFICE STAMPS,
Door Plates,
Steel Stencil-Cutting Dies, Soap Moulds and Brass Stamps.
SEND FOR PRICE LIST.

VULCAN UPRIGHT, CUSHIONED HAMMER



Fulfills all the requirements of a FIRST-CLASS HAMMER.
STRIKES A TRUE, SQUARE AND ELASTIC BLOW.
W. P. DUNCAN & CO. BELLEFONT, PA., U. S. A.

FACTS FOR MANUFACTURERS.
Special Wheels for Special Work.

Send for description and prices to
WALTHAM EMERY WHEEL CO., Waltham, Mass.

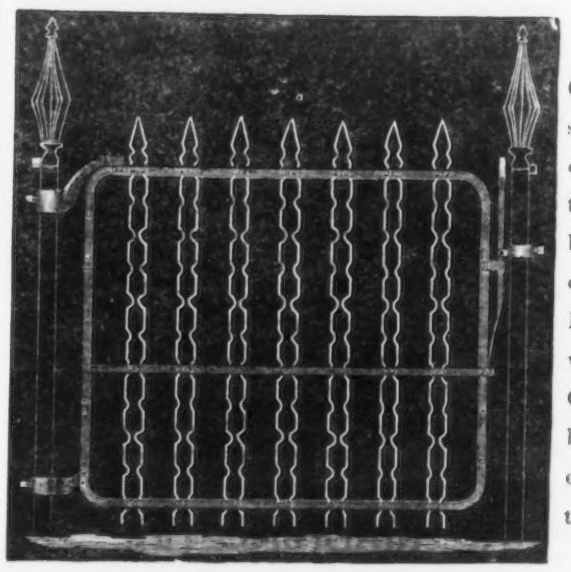
CHEMICALS AND APPARATUS
FOR THE ANALYSIS OF
Ores, Iron, Steel, Fuel, Fluxes, Furnace Gases, &c., our specialty.

Being direct Importers and Manufacturers, we can offer superior inducements. Sole Agents for
Trommsdorff's Chemicals: Joseph Kavalier's Superior Bohemian Glass: Schleicher & Schnell's Chemically Pure and Common Filter Paper: E. March Soehne's, Acid Proof German Stoneware Professor Jolly's Spiral Balances.

SPECIALTIES:
Strictly Chemically Pure Acids and Chemicals. Platinum in all its shapes. Glass Blowing and Engraving in all its branches. Superior German Porcelain, Balances, Weights, Testing Apparatus.

EIMER & AMEND, Nos. 205 to 211 Third Avenue, 18th St. Station Elevated R. R. NEW YORK.
ILLUSTRATED CATALOGUE MAILED ON APPLICATION.

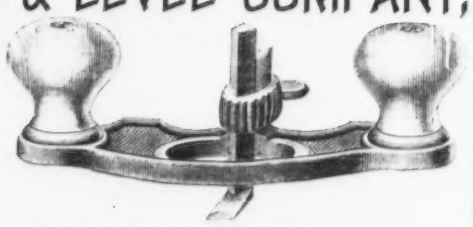
THE ROGERS & HAMILTON CO.,
MANUFACTURERS OF
SILVER PLATED WARE,
Waterbury, Conn.
THE BEST GOODS EVER PRODUCED IN AMERICA.



Our all-Steel Picket Gate, self closing, light, strong and handsome, deserves special mention. It is finished with black japan of best quality. Price, $3.50. Fittings for iron or wood posts included. Order now. We are behind our orders. Liberal discount to the trade.

HARTMAN STEEL CO., Limited.
General Office and Works: Beaver Falls, Pa.
BOSTON: 74 India St. | NEW YORK: 118 Chambers St. | CINCINNATI: 1 and 2 Wiggins Block. (No. 49.) | PHILADELPHIA: 413 Commerce St. | CHICAGO: 107 Dearborn St.

STANLEY RULE & LEVEL COMPANY,
MANUFACTURERS OF
IMPROVED
Carpenters' Tools.
FACTORIES,
NEW BRITAIN, CONN.
WAREROOMS,
29 Chambers Street,
NEW YORK.



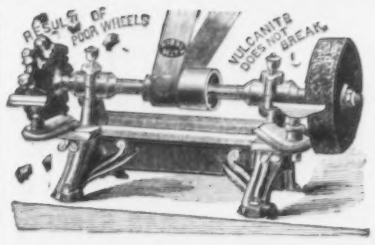
WOOD-WORKERS' HANDY ROUTER PLANE.
This tool should be added to the kit of every skilled Carpenter, Cabinet Maker, Stair Builder, Pattern Maker or Wheelwright.
No. 71. Iron Stock, with Steel Bits (¼ and ½ in.).....$1.50

BOILER AND PIPE COVERINGS,
Absolutely Fire Proof, Light and Cheap.

EASY TO APPLY.
Miners and Manufacturers, Braided Packing, Mill Board, Sheathing and Specialties.

ASBESTOS
CHALMERS-SPENCE CO.,
419-425 8th Street, N. Y.
BRANCHES:
Boston, 19 Pearl St. Phila., 34 S. 2d St. Chicago, 144-146 E. Lake St. Pittsburgh, 37 Lewis Block.

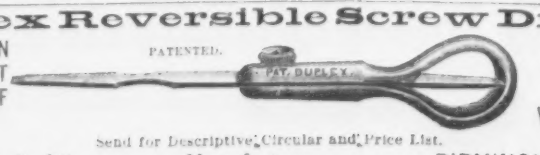
SWIFT RUNNING EMERY WHEELS.



THE ORIGINAL
SOLID VULCANITE
EMERY WHEELS
Runs Easy and Safe, Cool and True.
Is More Durable —— Hence Cheaper.
A trial will convince you of this.
KNIFE GRINDING WHEELS A SPECIALTY.

NEW YORK BELTING AND PACKING CO.,
J. H. CHEEVER, Treas. Sole Manufacturers, 15 Park Row, New York.

Duplex Reversible Screw Driver.
TWO SIZES IN ONE, AND AT THE PRICE OF ONE.



BEST CAST STEEL WARRANTED.
Send for Descriptive Circular and Price List.
C. THOMAS & CO., Manufacturers, BIRMINGHAM, CONN.

Nickel and Its Alloys.

Industries prints the following article: The principal alloy of nickel is German silver, a triple compound or admixture of nickel, copper and zinc; but another alloy is also in use, principally for purposes of coinage. This is composed of nickel and copper only, and is of white color, even when the nickel is present only to the extent of 25 per cent. Such is the composition of the coins struck for the Governments of Ecuador and other places at the Birmingham mint. An alloy of this kind is more suitable than ordinary coinage bronzes for circulation in hot climates, because copper in combination with nickel does not affect the skin so much as does the same metal in the form of bronze. An alloy of copper and nickel in equal parts is sometimes rolled, and has been employed by the British Government to a limited extent as a substitute for mild steel. These alloys are manipulated in a similar manner to German silver, and consequently will not call for further special mention here. The casting of German silver is in many respects similar to the same operation with brass, but there are certain important differences. It is found impossible in practice to make German silver by one melting in the pot, the high and sustained temperature necessary to bring about liquefaction of nickel causing excessive loss of the low melting and volatile zinc (spelter). For this reason the nickel is always alloyed in one operation with a portion of the copper, and the zinc and the remainder of the copper, in the form of brass, are added in a separate melting. It is the invariable rule of English casting shops to make one-and-one "mixing" and one-and-one brass; "mixing," it may be explained, is the name given to the alloy of copper and nickel. This alloy is made in 80-pound plumbago crucibles heated in a wind furnace, similar to the square section furnaces employed by brass casters, and fed by the best hard coke. It is necessary to use a good coke, since nickel alloys are much deteriorated by contamination with sulphur. About an hour is required from putting in the pot to pouring the metal, and the temperature must be very high.

To diminish oxidation and also to refine the ingredients, more particularly the nickel, borax is always added as a flux. This substance, though possessing many of the properties of an alkali when in aqueous solutions, has powerful acid properties at temperatures beyond redness. The boracic acid it contains is, like silicic, a feeble acid, but being, like the latter acid, fixed in the fire, it manifests important properties at these higher ranges of temperature, and borax, chemically speaking, contains a more than normal quantity of this acid. It will, therefore, be understood how the flux, by inducing a kind of scorifying action, brings about a partial refining of the contents of the pot. Mixing is run into pigs of a few pounds weight, and each of these should, when cold, present an upper surface somewhat concave, and covered with transverse wrinkles. If the metal show a smooth and bloated convex surface, the presence of impurities, and more particularly of sulphur, may be inferred. The casting of the brass for German silver making differs in no important respect from the ordinary manufacture of the same alloy for sand caster's use. The actual making of German silver begins when the mixing and the brass have been obtained. For pig metal—that is, German silver intended for remelting and casting in sand molds, it is sufficient to mix together the ingredients, fuse under a layer of charcoal and pour into pig molds; sometimes a little tin is added, to give increased whiteness and hardness. It is in the casting of strips for the rolling mill that the special skill of the German silver maker comes in. Many a good brass caster has tried his hand at German silver strip casting and failed, although, to a superficial observer, the two operations are identical. Both alloys, when required in the form of sheets or wire, are cast into strips, or, in the case of wire, into rods, and these are then reduced to the finished form by mere mechanical manipulations. But a German silver strip, or wire rod, treated exactly as a brass one, would, in ninety-nine cases out of a hundred, result in a sheet or wire, good, perhaps, at one end, but unsound through half of its dimensions. The reason is to be found in the greater shrinkage of the nickel alloy during solidification, and the remedy for this in the careful "feeding" of the ingot during cooling.

To compound German silver, of whatever quality, certain weights of mixing and of brass, together with a smaller quantity of copper, are necessary; and to allow for loss of zinc by volatilization during the melting, about 2 pounds of spelter per heat for low qualities, and 1½ pounds for the better qualities, are allowed, the heat being about 80 pounds. The ingredients are weighed out mixed with a certain quantity of scrap, and placed in the pot, which has been already heated to redness. The lumps of new metal are introduced with a pair of tongs, and the scrap by means of a long sheet-iron funnel reaching into the furnace. A few pieces of charcoal are now introduced, and the pot covered with a lid. When the charge has melted, the crucible is stirred with an iron rod, and the zinc allowed for waste is added, the pot being again stirred. Meanwhile the ingot molds have been prepared and placed in position. The molds are similar to those used for brass, and are of two halves, clamped together by rings and wedges. The molds are cleaned, rubbed inside with oil, and dusted with powdered charcoal (blacking). The caster raises the crucible from the furnace, and, holding it in position, pours the metal into the receptacle, while an assistant keeps back the floating pieces of charcoal with an iron rod. The mold is now full of German silver, and as the portion in contact with the cool surface solidifies, considerable shrinking takes place, and a hollow core begins to appear at the upper central part of the ingot. The skill of the workman is now brought to bear in supplying a fine stream of metal to prevent the formation of such a core. This stream is continued for some time, and the ingot is thus fed until the last portions form a projecting button at the center of the upper extremity.

Mixing, it may be mentioned, is always made in plumbago crucibles, the charge being diminished in each successive heat, to prevent the corrosive flux acting successively upon the same zone of the pot. German silver is melted in plumbago pots, or in the best fire-clay crucibles; the latter are, perhaps, better for the purpose, since they radiate heat with less rapidity, and remain hot for a longer time—a point of some importance when the pouring takes a considerable time, as in filling ingots for wire rods. If the ingots are intended for rolling into spoon strips, the nickel need not be of the very finest quality, because such strips are thick, and destined to undergo only a moderate amount of mechanical strain. Into metal of this kind, a little inferior scrap, filings, &c., may be introduced; but, of course, it must not be supposed that any rubbish will answer the purpose of the spoon and fork manufacturer. German silver that is destined to undergo the trying operations of raising, deep stamping or drafting, must be compounded of the best brands of spelter, such as Upperbank, D. & Co., and of best selected copper; the nickel should be either grain nickel or the cake nickel made by the Nickel Company. A brand of nickel containing varying quantities of copper, imported from Sweden in the form of powder, also gives very good results. Only a limited quantity of the best "raising-metal" scrap should be introduced; but this little, if good, has a tendency to improve the working properties, although the reason is not very evident. The ingots of raising metal are now planed on the flat faces, in order to remove the hard skin and the inequalities which would impair the surface of the finished sheets; spoon metal is usually not planed.

When the metal reaches the rolling mill it is treated cold, in a similar manner to brass, the first operation being known as "breaking down." The ingots are passed diagonally between very powerful rolls until they have attained to rather more than the breadth of the required sheet (to allow for trimming), and have at the same time, of course, increased in length. This treatment is followed by passages longitudinally through smaller rolls. From time to time, and from the outset, the metal is annealed by heating it in a furnace and cooling with water; after each annealing, the scale must be removed by pickling in dilute sulphuric acid, assisted by scouring with fine sand. Sometimes bright sheets are ordered, and when this is the case, the final pickling is done with aquafortis (nitric acid). The following table gives the composition of the various qualities of German silver; "hollow-ware" or "raising metal," it will be noticed, contains proportionally less zinc and more copper than spoon metal or sand caster's pig. The mixtures of the various makers vary a little, some using more copper than others per unit of nickel; the former qualities are somewhat reddish, while the latter have a yellowish tinge:

TABLE I.—*G. S. as Weighed Out.*

	Lbs. per heat.			Percentages.		
	Copper.	Mixing. (1 & 1)	Brass. (1 & 1)	Copper.	Zinc.	Nickel.
"Best best."	8	34	27	55.79	19.56	24.64
"A," "hollow-ware."	6⅝	33¼	26¼	54.97	20.07	24.95
"A"	6⅝	27⅛	33¼	56.87	23.73	19.38
Special 1st (spoon)	10	29	33	57.23	21.73	21.01
1st spoon	11	24	30	58.46	23.08	18.46
1st hollow-ware	18	24	21	64.28	16.66	19.05
2d spoon	8	18	40	56.06	30.3	13.63
2d hollow-ware	15	18	29	62.10	23.38	14.51
3d spoon & 3d hollow-ware	8	11	42	56.25	32.81	10.93
4th spoon and 4th hollow-ware	8	12	48	55.88	35.30	8.82
5th spoon and hollow-ware	10¾	8½	50	57.70	36.10	6.13
"Portland."	7½	6	54	55.58	39.98	4.44

TABLE II.—*As Analyzed. Results in Per Cent.*

Quality.	Copper.	Zinc.	Nickel.	Iron.	Lead.
Qual. spec. 4th	56.48	33.11	9.57	.39	.49
Qual. spec. 4th	56.08	33.55	9.56	.39	.36
Sp. 1st spoon	48.17	29.28	21.66	....	....
"B.B."	51.14	24.47	23.51	....	....
"B.B."	52.80	20.38	26.06	....	....
3d	64.32	23.98	11.21	....	....
2d "H."	63.34	22.64	13.58	....	....
"A1"	54.70	20.25	24.67	.75	.26

Changes at the Brooklyn Bridge.—Messrs. Clarke, MacDonald and C. E. Emery have submitted a plan, which they have been authorized to carry out, to improve the facilities for handling traffic at the New York terminus of the Brooklyn Bridge. The plan provides that the promenade shall be continued from the stairway at the New York anchorage by an iron trestle about 15 feet above the level of the cable road, through the center of the bridge house, to a platform from which the street can be reached by a double staircase. The promenade entrance will be about 36 feet above the street and about level with the top of the elevated railroad station. The present entrance to the promenade will have a broad stairway leading to a platform between the tracks, 19 feet wide and about 350 feet long, for the use of outgoing passengers. The parallel of the tracks inside the bridge-house will be continued only to the eastern side of Park Row, and the tracks across the street are to be removed to supply platform and stairway room. The plan contemplates doing away with switch engines entirely by putting in duplicate tracks and duplicate cables, one set of which will turn off from the north to the south track about 600 feet east of the end of the road. Every alternate train will be run upon this track and discharge its passengers upon the outside platform on the south side of the station. Trains on the other track are to run directly into the station as at present, and discharge their passengers upon the outside platform on the north side; both trains loading from the center platform, that on the south track will proceed directly across the bridge, while the other will cross to the south side by its own cable east of the station. By this scheme only one set of switches will be required. These changes, when completed, are expected to prove of great value in enabling the authorities to handle more rapidly the ever-increasing traffic of the bridge, and thereby increase its usefulness.

THE MOST EXTENSIVE MAKERS OF RAZOR STROPS IN THE WORLD.

J. R. TORREY & CO., WORCESTER, MASS.

CUSHION BELT STROP WITH HONE, No. 230.

A Combination of the Elastic, Square and Belt Strops. We Highly Recommend it for Practical Use.

No. 230 is made only of the very best of selected material, and is the MOST POPULAR STROP on the market with all who desire an article for practical service: it is warranted to set a finer edge to a Razor and do the work more rapidly than any other Strop. It is enclosed in a Fine Imitation Morocco Covered Case, with an Elegant Gold Embossed Label.

SEND FOR ILLUSTRATED CATALOGUE.

New York Office, 97 Chambers Street.

UNDERHILL, CLINCH & CO.,

94 Chambers Street, New York,

DEPOT FOR

O. AMES & SON'S SHOVELS, SPADES AND SCOOPS.

E. W. Gilmore & Co.'s Strap and T. Hinges.
W. & S. Butcher's Edge Tools.
Nicholson File Co.'s Files.
Russell Jennings' Auger Bits.

Geo. Selsor & Co.'s Hatchets, Hammers, &c.
American Screw Co.'s Wood and Machine Screws Stove and Tire Bolts, Rivets, &c.
Brade's Brick Trowels.
A. Field & Son's Tacks, Brads, Nails, &c.

GENERAL HARDWARE.

DAME, STODDARD & KENDALL,

IMPORTERS, MANUFACTURERS' AGENTS AND DEALERS IN

FINE FISHING TACKLE

OF EVERY DESCRIPTION.

SELLING AGENTS FOR

Skinner's Celebrated Fluted Trolling Spoon Baits.
Patent Adjustable Floats and Sinkers.
Nason's Patent Portable Net Ring and Staff.
Crosby's Hunting Hatchets and Camp Axes with patent covers.
Globe Braided Silk Linen and Cotton Lines.
Wheeler's Celebrated Split Bamboo Fishing Rods.
Allen's "Hand Laid" Fishing Lines.
Robert Murphy's Fish Spears and Gaff Hooks
The "Isaac Walton" Fishing Suits.

Manufacturers of Lancewood, Greenheart and Bamboo Fishing Rods.

DAME, STODDARD & KENDALL,

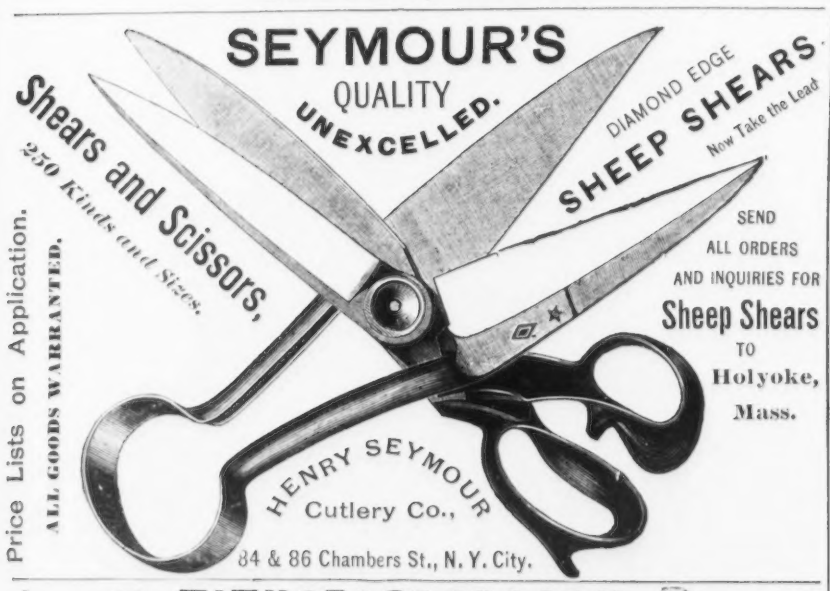
Successors to BRADFORD & ANTHONY,

374 WASHINGTON STREET,

BOSTON, MASS.

SEYMOUR'S

QUALITY UNEXCELLED.



SEND ALL ORDERS AND INQUIRIES FOR Sheep Shears TO Holyoke, Mass.

ALL GOODS WARRANTED. Price Lists on Application.

FINEST CRUCIBLE STEEL.

TITUS & BABCOCK,

ROCHESTER N. Y.

MANUFACTURERS' AGENTS FOR

BEST MALLEABLE IRON.

LIST PRICE.

1,000 pounds Capacity.....$4.75	2,000 pounds Capacity.....$6.00	6,000 pounds Capacity.....$10.00
1,500 " 5.00	3,000 " " 7.00	8,000 " 12.00
	4,000 " " 8.00	

DOSCHER & DIXON,

Commission Hardware, &c.,

88 Chambers St., New York,

SOLE AGENTS FOR G. W. BRADLEY'S EDGE TOOLS.

Carpenters' Tools, Farmers' Tools, Coopers' Tools, Turpentine Tools, Garden Tools,

Martin Doscher's Planes; Bench, Moulding and Hand-made.

Clayton Brothers,

BRISTOL, CONN.,

Manufacturers of **Cast Shears,** Screw Drivers, Kitchen Knives, Roller Skates, &c.

The Best and Cheapest in the Market. Send for Prices.

SCREW DRIVERS

OF ALL KINDS

A SPECIALTY.

Send for Catalogue and Full List.

THE ELLRICH HARDWARE MANUF'G CO.,

HARDWARE SPECIALTIES,

Plantsville - - - Conn.

CORPORATE MARK,

JOSEPH RODGERS & SONS'

(LIMITED)

CELEBRATED CUTLERY,

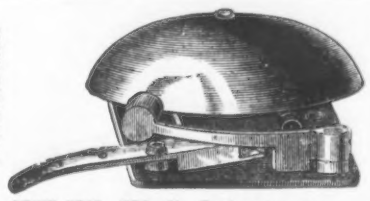
No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, AGENTS.

The demand for JOSEPH RODGERS & SONS' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam-power.

To distinguish articles of JOSEPH RODGERS & SONS' manufacture, please to see that they bear their Corporate Mark.

Established 1838.



BEVIN BROS., MFG. CO., Easthampton, Conn.

Manufacturers of

Sleigh Bells, House, Tea, Hand, Gong Bells, &c.

Established 1836.

Alfred Field & Co.,

93 Chambers and 75 Reade Streets.

NEW YORK

IMPORTERS OF

HARDWARE, CUTLERY, GUNS.

SOLE AGENTS FOR

Joseph Elliot & Son's Razors.
Eley Bros.' Caps, Wads, &c.
Isaac Greaves' Sheep & Garden Shears.

HEADQUARTERS FOR

Wostenholm's Pocket Cutlery & Razors.
W. & S. Butcher's Razors.
John Wilson's Butcher Knives, &c.

ANVILS. CHAIN. FILES.

THE BARTON BELL CO.,

East Hampton, Conn.,

MANUFACTURERS OF

Sleigh Hand, House, Tea and Call Bells in great variety.

Illustrated catalogue on application.

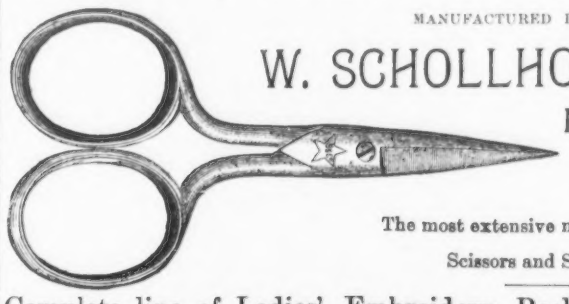
JOHN H. GRAHAM & CO., Agents.

113 Chambers St., New York,

Where a Complete Stock is Maintained.

The Star Scissors and Shears,

MANUFACTURED BY



W. SCHOLLHORN & CO.,

New Haven, Conn.

The most extensive makers of *strictly first-class* Scissors and Shears in America.

Complete line of Ladies', Embroidery, Pocket, Buttonhole and Editors' Scissors, Tailors' Points, Straight and Bent Trimmers, Barbers', Bankers' and Paper Shears.

We produce only *the very best* in quality and finish.

SPECIAL NOTICE.

The desperate attempts of some of our esteemed competitors' drummers, to condemn in the eyes of our customers the quality of the

STAR SCISSORS AND SHEARS,

speak volumes of our complete success in manufacturing the best article in the market.

CLEVELAND MACHINE CO.,

SUPERIOR SOLID STEEL SHEARS

Forged from Bar Steel and Tempered in Oil.

We Challenge Competition for Cutting and Wearing Qualities.

THE FINISH AS GOOD AS THE BEST.

We Expect to Lead and you cannot afford to lose a chance of keeping posted on the *improvements* of the age. Get our Prices and then try a sample order. Your customers will compel you to order again. Address, with name of paper you saw this in,

CLEVELAND MACHINE CO.,

143 to 161 Leonard St. Cleveland Ohio, U. S. A.

A. FIELD & SONS,

Taunton, Mass.,

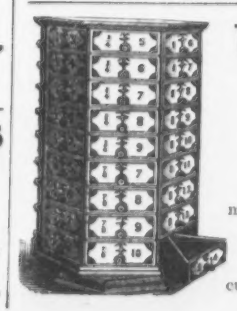
And No. 88 Chambers St., New York.

—MANUFACTURERS OF—

TACKS,
WIRE NAILS,
SHOE NAILS,
LINING AND SADDLE NAILS,
BRASS AND SILVERED ESCUTCHEON PINS,
BOAT NAILS, CHISEL AND BLUNT POINT,
3D FINE NAILS, STEEL OR IRON,
SMALL NAILS, ALL STYLES,
GLAZIERS' POINTS,
&c., &c., &c.

PHILADELPHIA WAREHOUSE: - - 409 COMMERCE STREET.

BALTIMORE AGENTS: WEIR & WILSON, 14 WEST GERMAN STREET.



THE AMERICAN BOLT AND SCREW CASE CO.,

DAYTON, - OHIO.

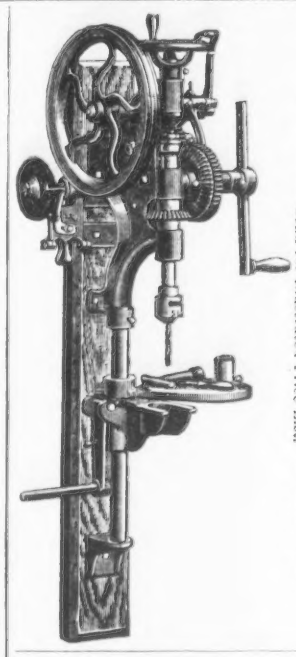
MANUFACTURERS OF

Patent Revolving Bolt and Screw Cases.

☞ We are the only manufacturers of Bolt Cases and the only parties who make lists of Bolt or Screw Cases to suit stock of purchaser without extra charge.

COMBINATION BOLT AND SCREW CASES TO ORDER.

Sold by the leading Jobbing Hardware Dealers. Send for Illustrated Circular. All Cases guaranteed.



GEO. BURNHAM & CO., Manufacturers of, Worcester, Mass.,

BLACKSMITHS' UPRIGHT SELF-FEEDING DRILLS

HAND OR POWER.

Patented March 20, 1883, Oct. 23, 1883 and June 16, 1885.

Superior Design. Unrivaled Workmanship. Latest Improvements.

Send for Illustrated Price List.

ESTABLISHED 1830.

C. S. OSBORNE & CO.,

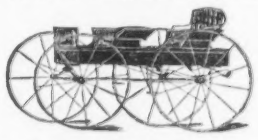
NEWARK, N. J. STANDARD Manufacturers of PLUMBERS' TOOLS. Send for Price List. Ask your dealer for our make and take no other.

HOTCHKIN

Carriage Works

We manufacture Open and Top Buggies, consisting of the Side Spring, End Spring, Brewster, Timken and Edward Storm Spring.

Also various styles of Two-seated Carriages and Wagons



LIBERAL DISCOUNT TO THE TRADE

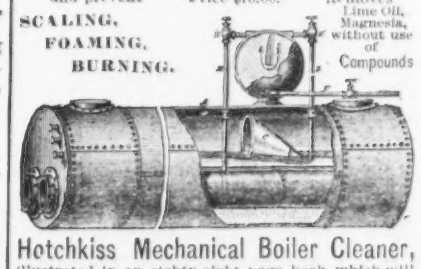
Send for Catalogue and Prices before buying.

Hotchkin Carriage Works,

SYRACUSE, N. Y.

"HOW TO KEEP BOILERS CLEAN"

and prevent SCALING, FOAMING, BURNING. Price $75.00. Removes Lime Oil, Magnesia, without use of Compounds



Hotchkiss Mechanical Boiler Cleaner,

illustrated in an eighty-eight page book, which will be mailed FREE to any address by JAS. W. HOTCHKISS, 120 Liberty st., New York. Beware of infringers.

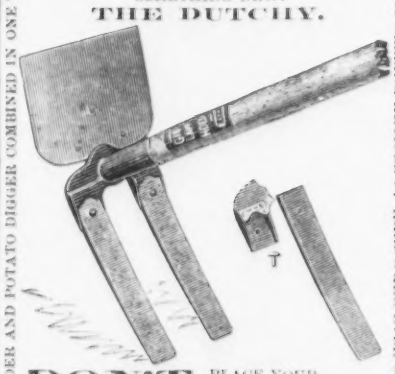
Gibbs Lawn Rake Co.,

CANTON, OHIO, U. S. A.

SOMETHING NEW.

THE DUTCHY.

A GARDEN HOE, WEEDER AND POTATO DIGGER COMBINED IN ONE TOOL.



THE BEST SELLING ARTICLE OF HARDWARE EVER OFFERED TO THE TRADE.

DON'T PLACE YOUR ORDERS FOR

Lawn Rakes, Post Hole Diggers,

Potato Diggers, Etc.,

until you have first seen our New Catalogue. Sent free upon application.

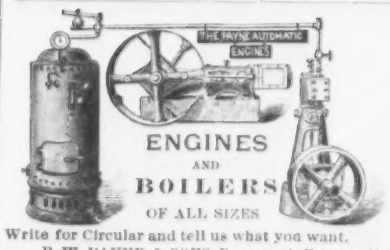
IT WILL PAY YOU.

NEW YORK AGENT,

W. S. ESTEY, - 71 Fulton Street.

CHICAGO AGENT,

F. R. MYERS, 54 Dearborn St.



ENGINES AND BOILERS OF ALL SIZES

Write for Circular and tell us what you want.

B. W. PAYNE & SONS, Drawer 36, ELMIRA, N. Y

10 S. Canal St., Chicago, Ill. 47 Dey St., New York.

Our patented Vertical Boiler will not prime. No danger of burning flues.

HALL & ELTON'S GERMAN SILVER.

1887 HALF A CENTURY. 1887.

In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

HALL, ELTON & CO., - - - WALLINGFORD, CONN.

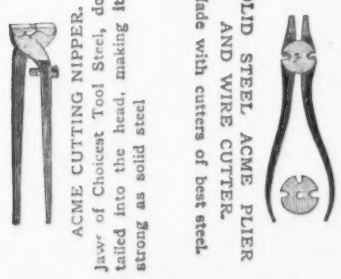
FLORENCE TACK Co.,
P. O. BOX 39, *FLORENCE, MASS.*,
Manufacturers of every variety of

TACKS, SMALL NAILS, DOUBLE-POINTED TACKS and STAPLES.

OUR STEEL CLINCH STAPLES will drive in harder wood or mortar than when made from Iron. They can also be clinched as well as any soft Iron Staples.

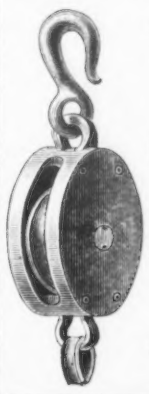
WILLIAM S. FEARING,
100 Chambers St., NEW YORK,
SELLS TO THE TRADE
Sheet Brass, Fancy Sheet Brass, German Silver, Copper, Brass and German Silver Wire, Brazed and Seamless Brass and Copper Tubes, Brass and Copper Rods, Brass Ferrules, Seamless Copper House Boilers, Sheet and Ingot Copper, Spelter, Tin, Antimony, Lead, &c.

ACME CUTTING TOOLS.
Made in all Sizes.



HIGGANUM HARDWARE CO.
HIGGANUM, CONN.

SHUBERT & COTTINGHAM,
MANUFACTURERS OF ALL KINDS
TACKLE BLOCKS.
Lignum-Vitæ and Iron Sheaves.
WITH
Plain, Roller and Self-Lubricating Bushings.
Heavy Purchase Blocks
FOR
Contractors, Builders, Railroad and Mining Use.
118 North Delaware Avenue,
Factory: Beach and Norris Sts.,
PHILADELPHIA, - - PA.
SEND FOR '87 CATALOGUE.



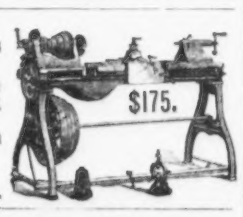
STAR ❋ BRAND ❋ TACKLE ❋ BLOCKS,
For Railways, For Contractors, For Bridge Builders and General Trade.

We would particularly call attention to our Self-Adjusting Five Roll Roller Bush Blocks which for strength and durability cannot be equalled by any other make. These Roller Bushed Blocks *give twice the purchase* of the Iron Bushed Blocks, and are far more preferable to use on account of greater ease in hoisting. Try them and find out for yourselves. Call for the "Star Brand" SELF-ADJUSTING FIVE ROLL ROLLER BUSH BLOCKS.

BAGNALL & LOUD BLOCK CO.,
162 Commercial Street, Boston, Mass.

W. H. McMILLAN'S SON,
MANUFACTURER OF
Wrought Iron and Inside Iron Strapped
Tackle Blocks, Pumps, Mast Hoops, Hanks, Belaying Pins,
HAND SPIKES, HAND PUMPS, &c.
LIGNUMVITÆ WOOD A SPECIALTY.
113 South St., up stairs, Between Peck Slip and Beekman St., New York.
Factory: 32 and 40 Penn St., Brooklyn, E. D.

Sebastian May & Co.'s IMPROVED SCREW CUTTING FOOT and LATHES POWER
Drill Presses, Shapers, Band, Circular and Scroll Saws, Machinists' Tools and Supplies. Lathes on trial. Catalogue mailed on application.
179 WEST SECOND STREET, CINCINNATI, O.



PRISON LOCKS.

We have for many years made a specialty of Prison and Jail Locks, and have furnished the locks for many large prisons, and for a great variety of cells and doors. Our line of Locks is so extensive that we can usually fill any requirement from our regular patterns; but should this prove not to be the case, we have unusual facilities for producing any special locks required.

As to the security and quality of our locks we need only say that we maintain in our prison locks the same standard of excellence which has given the Yale Locks for all purposes their pre-eminence.

Catalogues, Sample Locks and Estimates on Application.

THE YALE & TOWNE MFG. CO.,
Stamford, Conn.,
New York, Chicago, Philadelphia and Boston.

English Letter.

(*From Our Regular Correspondent.*)

LONDON, May 16, 1887.

THE WEEK

has been quiet, as a whole, but in some quarters there is rather more "tone" than has been observable lately. Probably this is owing to the fine weather, which is giving somewhat greater confidence to the agriculturists, as well as to builders and others interested in outdoor occupations. So far as can be seen at present, the farmers are likely to have a pretty good season, although the hay harvest is likely to be a late one. In a general way all our farmers are in a "parlous plight," and are almost devoid of ready money, but they are hoping for better times, and another good harvest will aid them very materially. Then, again, the rather better feeling may have been assisted by the commencement of the "Jubilee" festivities, the first of which took place on May 14, when the Queen and other members of the Royal family traversed London in state for the purpose of opening a people's palace amidst the toiling masses of the east end of the metropolis. As I remarked last week, everybody is heartily sick of "Jubilee" talk, but the realities will be heartily embarked in and some good is sure to result to trade therefrom.

In the iron trade circles here I hear as much grumbling as ever—perhaps a little more. The business falling to the share of individual firms or persons is said to be miserably small. Orders are received for lots of 5 and 10 tons where in former periods they were for as many hundreds. To do as much in the aggregate, therefore, ten times the labor and trouble are involved and even then the profit is by no means commensurate. Where pounds per ton were cleared firms are now thankful to get 5/ or 10/ for themselves, and they cannot always get that, as much of the current business yields no more than 2½ or 5 %. Prices are terribly low—much lower indeed than appears on the surface. I hear of best Staffordshire bars being sold at £5. 17/6, whereas, as you know, the marked bar houses are still quoting £6. 10/ to £7. Either the iron sold at £5. 17/6 is not "best," therefore, or those selling it are doing so at a loss. I am inclined to believe that there is some jugglery in the nomenclature, and I am confirmed in that opinion by the fact that a government contract for "Best Best," or double best bars, has been done at £5. 5/ per ton—which is certainly not nearly the actual price of that good grade of iron. Probably "things are not what they seem," and the maxim, *caveat emptor* never had fuller or truer application than at the present time.

THE AMERICAN EXHIBITION

in London exists. I have seen it myself, and, being built on the George Washington lines, you may take my word for it. I went over it this afternoon as a matter of strict fact, and I make you a present of my impressions. I am greatly disappointed with it. As a circus or Buffalo Bill show it may pass muster, but as an exhibition representing the abilities and products of the United States it is simply beneath criticism. It is now a week after the official opening, yet scores—probably hundreds—of the exhibitors are not on hand, and those who have unpacked are not likely to do much credit to the great American nation. Few, if any, of your chief concerns are represented, and indeed I hardly know any of the firms who are present, although I claim to be well acquainted with your principal houses and products. Take any number of *The Iron Age*, glance at the advertisements and then look through this exhibition, and one must come to the conclusion that the affair will be likely to do more harm than good to American products and industry. I heard several good humored British criticisms to-day, and I cannot wonder that Johnny Bull softly smiles when he sees the poor display made by his much-praised American cousins. As a show the exhibition is incalculably inferior to the Colonial, Health or other recent exhibitions in London—indeed, it is not within measurable distance of the Canadian section alone at last year's Colonial Exhibition. I know, of course, that it is in no sense representative, and that it is repudiated by the American nation, but the British public does not know this, and, as the show is being gushingly advertised and freely bepuffed, it is tolerably certain that American products will suffer in consequence. Meantime Buffalo Bill and his dirty Indians are drawing big crowds; but I fancy that the attraction will soon pall, as the circus is not an affair one would care to visit more than once.

THE STRIKES

in your coke and coal trades are being carefully watched on this side, under the impression that they may send some orders to our producers of Bessemer blooms, billets, &c. So far, there has been virtually no indication of actual early business, but there are sundry carefully worded inquiries about, which may ultimately cause sales to be effected. I learn that some actual offers are being made on United States account for blooms, billets, heavy wrought scrap and old rails, but the prices offered are 2/6 @ 1/ respectively below holders' ideas, and as neither party will give way, the dead lock hinders business. The uncertainty of freights has a tendency in the same direction.

SCOTCH PIG IRON

is quiet, and no great amount of business is being done. Warrants stand at about 41/, as against 38/2 a year ago. There are 81 furnaces in blast (54 on ordinary, 6 on basic, and 21 on hematites), as compared with 90 this date, 1886. In Connal's stores there are 872,109 tons, an addition of 3191 tons last week, against 753,922 a year ago. Shipments to date this year have been 137,559 tons, a net increase of 7870 tons. The importations of Middlesboro' pig into Scotland this year have been 127,105 tons, an increase of 13,770 tons. Quotations for Scotch brands I omit, as having been anticipated by cable.

MIDDLESBORO' PIG

is fairly steady, on the basis of 33/9 @ 34/ prompt for No. 3, and about 6d. @ 1/ more for near futures.

HEMATITE PIG IRON

is irregular, owing to the continued underselling by second holders, who are 1/ @ 2/6 below makers. West Coast brands are as under:

	No. 1.	No. 2.	No. 3.
Cleator	46/		45/6
Lonsdale	45/	44/6	44/
Workington	45/	44/6	44/
West Cumberland			
Lowther	45/	44/6	44/
Distington	45/	44/6	44/
Solway	45/	44/6	44/
Maryport	45/	44/6	44/
Harrington	46/6	45/6	45/

There are 54 furnaces at work, against 42 a year ago. In the stores only stocks are 170,191 tons, an increase of 47,098 tons this year. Pig-iron shipments to date from West Coast ports are 105,347 tons, an increase of 8017, while rail shipments are 162,877 tons, an increase of 72,694 tons to date.

IN THE IRON MARKET

a more hopeful feeling has ruled during the last few days, for what reason it is difficult to trace, unless it be the more seasonable weather. The closing price of Scotch warrants was 41/2 ⅊ ton. In Cleveland there has been greater hopefulness, but No. 3 G.M.B has changed hands at 33/9 for prompt delivery, and at 3d. better for delivery over next month. On the West Coast the attitude of makers toward the market is still one of comparative indifference, and no alteration has transpired. Quotations for mixed numbers are therefore nominal at from 43/6 to 45/6. In Staffordshire quietude has prevailed, the demand being slight and makers not desirous of a large business at ruling values. Buyers, however, claim to have the best of the market. In sheets, both black and galvanized, reports are rather less depressing, there having been more inquiries and a little better business as to volume, though not as to prices, late rates being still adhered to. In bars and hoops, angles, and other manufactured iron, the dullness has continued for the most part, although in one or two respects there is reported to have been a little upward movement of a *bonâ-fide* character. Buyers, however, are as much inclined as before to hold off the market for the present. In old rails and scrap little or no business is doing, as sellers will not entertain the proposals of buyers. Quotations are nominally the same as last week, but are irregular all round. Freights continue steady for pig iron by ordinary steamer at 7/6 ⅊ ton. For less regular shipments, quotations rule higher, and are irregular, especially to the United States, owing to the scarcity of cargoes for the homeward voyages. Steel has been a shade easier, there having been a slight falling off in the demand for general requirements. The lighter departments remain active, but makers complain of the lowness of prices. Business in blooms for the United States has been practically dead during the week, notwithstanding the existence of several inquiries. Nominally quotations are 75/ for 7 x 7 inches. Billets are quoted 92/6 @ 95/ for Siemens-Martin, and 77/6 for basic, f.o.b. Glasgow. On the East Coast, basic rule at about 75/ f.o.b. Middlesboro' steel rails are in but moderate request this week, the principal inquiry being for some 13,000 tons of 50-lb section for the Indian State Railway. There is a report that the order of the Bombay and Barodo Company have been placed on the East Coast.

TIN PLATES.

In London these are in a somewhat stronger position than they were last week, American buyers showing a little more disposition to place orders. Most of the works are reported fairly well off for work. I quote ordinary IC cokes, f.o.b. Liverpool, 12/9 @ 13/. At Liverpool, though the inquiries for tin plates are numerous enough, they do not mean in many cases actual business, unless at extremely low figures. As usual, the bulk of the inquiries have been for the two sorts of steel plates—viz.: Bessemer and Siemens with coke tinning, as well as the old style of coke tin plates. The latter seem to be coming well to the front once more, and in large, well-assorted specifications of specialties, both as to size and substance. These sorts are also required in the Siemens and Bessemer steel cokes. If coke tin plates and Bessemer steel cokes could be had at about 13/ IC or so, there would be a big business doing in them; but makers, as a rule, are pretty firm at 13/3 @ 13/6 I C. Ordinary sizes are 12/10½ @ 13/ IC, and some favorite brands even higher. Siemens steel cokes are 13/6 @ 14/ IC, but most of the orders are booked at the former figure. There has been a better demand for charcoal tin plates. Quotations are from 14/ to 15/6 for ordinary; 16/ @ 17/6 for good charcoal tin plates, and higher for some of the better class brands. Ternes are not in such brisk demand as tin plates, and there has not been much doing in any of the grades. Medium sorts are chiefly in demand at 12/6 @ 13/ IC. Coke tin wasters continue in fair demand at 12/3 @ 12/9, and they are not very plentiful, either.

THE HARDWARE TRADES.

In London, the improvement in the weather has brought out buyers of horticultural requisites, games, appliances, and of general furnishing ironmongery. Still, it will take a considerable degree of activity during the remainder of the season to make up for the time lost through the delay in the opening up of true spring weather. Business in heavy hardware is, on the whole, rather quiet. The further drop in the rate of exchange has materially checked business with India, China, and other Eastern markets. Australia is sending forward about an average of orders, while South America keeps pretty good, and the Cape continues to show greater activity than for years past. At Birmingham, the sudden advent of summer weather is favorably affecting the order sheets from all parts of the country, and especially the coast towns and agricultural districts, and there is a better feeling all round in commercial circles than there has been for some months past. The improvement is assisted by the arrival of some good shipping orders from Australia and New Zealand, which have been very good customers for iron and hardware since the beginning of the year. The orders, which are arriving by cable as well as by mail, represent a heavy tonnage of

H. D. SMITH & CO.,

Plantsville, Conn.,

MANUFACTURERS OF THE

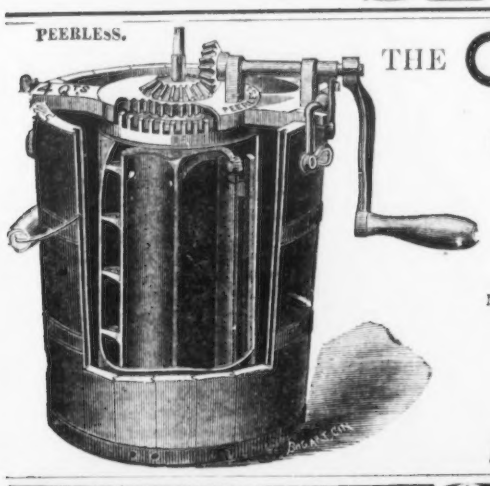
BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forged Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

PEERLESS.



THE **GOOCH "PEERLESS"**

AND

"GIANT" FREEZERS.

Our Freezers Stand Unrivaled. The Best Goods Ever Made.

SUPERIOR IN EVERY PARTICULAR.

NO OTHER FREEZERS EVER HAD SUCH A SALE. SEND FOR PRICE LIST AND DISCOUNTS.

PRICES REDUCED FOR 1887!

Manufactured by **The GOOCH FREEZER COMPANY,**

Nos. 28, 30, 32, 34, 36 & 38 E. NINTH ST., CINCINNATI, OHIO.

GIANT.

Are you using

SASH CHAINS

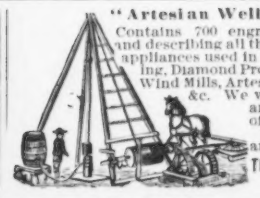
MADE BY

"Thomas Morton"

65 Elizabeth St.,

New York?

If not, send and get prices



"Artesian Well Encyclopedia." Contains 700 engravings, illustrating and describing all the practical tools and appliances used in the art of Well Sinking, Diamond Prospecting Machinery, Wind Mills, Artesian Engines, Pumps, &c. We will send this book to any party on receipt of 25c. for mailing. Expert Well Drillers and Agents Wanted. The American Well Works Aurora Ill. U. S. A.

The ACME SHEAR CO.

Bridgeport, Conn., U. S. A., Manufacturers of

CAST SHEARS.

The *Best* and *Cheapest* in the market. Lamp Trimmers, Lemon Squeezers, Ice Picks and Tongs, Nut Crackers &c. Send for price list of specialties.

NATIONAL KEG WORKS

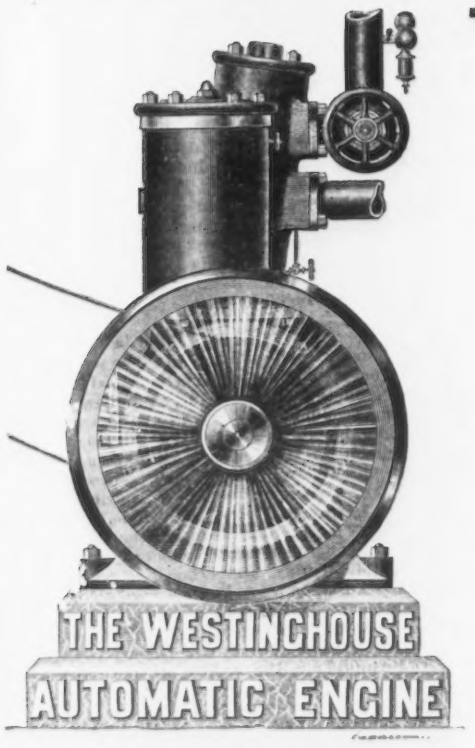
Office, Birmingham, Conn.

Capacity 5000 per day for Nails, Nuts, Washers, &c.

WESTINGHOUSE, CHURCH, KERR & CO.,

Contracting and Consulting Engineers,

17 CORTLANDT STREET, NEW YORK. HAMILTON BUILDING, PITTSBURGH, PA.



The Westinghouse Automatic Engine.

PRICES REDUCED.

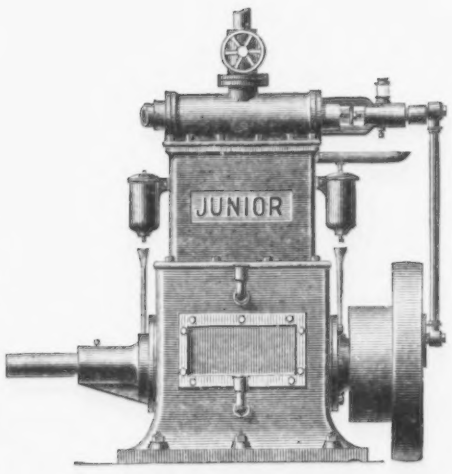
Condemned by its Competitors and Endorsed by its Users.

THE "JUNIOR" AUTOMATIC ENGINE,

15, 25 AND 35 H-P. ONLY.

THE LOWEST PRICED ENGINE IN THE MARKET.

WELL BUILT AND SERVICEABLE.

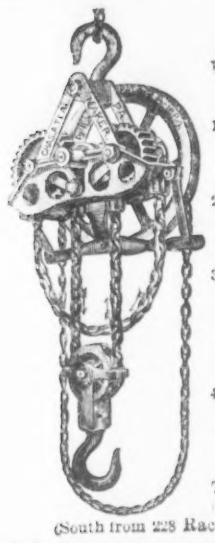


The Westinghouse Machine Company,

PITTSBURGH, PA.

Sales Department for the United States Conducted By

WESTINGHOUSE, CHURCH, KERR & CO., 17 Cortlandt St., New York, Hamilton Building, Pittsburgh, Pa.
FAIRBANKS, MORSE & CO., - Chicago, Ill.
FAIRBANKS & CO., - - St. Louis, Mo.
PARKE & LACY, - - San Francisco, Cal.
UTAH & MONTANA MACHINERY CO., Salt Lake, Utah.
D. A. TOMPKINS & CO., - Charlotte, N. C.
ROBERT MIDDLETON, - Mobile, Ala.
H. DUDLEY COLEMAN, - New Orleans, La.
KEATING IMPLEMENT & MACHINE CO., Dallas, Texas.
IRON BAY MANUFACTURING CO., Marquette, Mich.



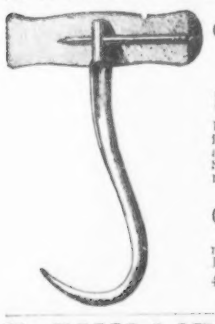
TEAL'S
Portable Hoist,
Patented, April 8, 1884,

Advantages claimed.

1st. Being made with Spur-Gears and at the same time sustaining the load at any point.
2d. One man of ordinary strength is capable of raising the load for which each hoist is built.
3d. The ability of rapidly raising or lowering the empty hook by pulling on the lift-chain, instead of the slow and tedious process by the hand chain.
4th. Being provided with self-oilers is always lubricated, which adds both to the ease of lifting and the life of the hoist.

TEAL HOIST COMPANY (*Limited*,) 146 Bread St (South from 228 Race) Philadelphia.

N. Y. MALLET & HANDLE WORKS,



Manufacturers of Calkers', Carpenters', Stone Cutters', Tin, Copper & Boiler Makers'

MALLETS,

Hawsing Beetles, Hawsing and Calking Irons; also all kinds of Handles, Sledge, Chisel and Hammer Handles.

ALSO

Cotton & Bale Hooks

Patented Feb. 13, 1877, a new combination of Hooks.

456 E. Houston Street, NEW YORK CITY.

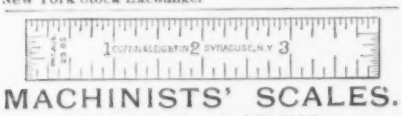
E. PHILLIPS & SONS,
MANUFACTURERS,
South Hanover, Mass.

TACKS.

F. R. EMMONS & BRO.
21 WARREN STREET,
New York.

P. W. Gallaudet & Co

Cor. Broadway and Wall St., New York. Bankers and dealers in COMMERCIAL PAPER. Stocks and Bonds dealt in for cash or on margin at New York Stock Exchange.



MACHINISTS' SCALES.
PATENT END GRADUATION.
Liberal Discount to the Trade. Send for List.
COFFIN & LEIGHTON, Syracuse, N. Y.

The Curtis Steam Trap.

Has automatic air discharge; has a differential opening, thus discharging all the water as fast as it comes. Is very accessible for cleaning, the valve being on the outside. Send for circular. Manufactured by the

CURTIS REGULATOR CO.,
61 Beverly St., BOSTON, MASS.
GENERAL AGENCIES: 109 Liberty St., New York; 66 N. 4th St., Philadelphia, Pa.; 408 Fifth Ave., Chicago, Ill. 210 So. 3rd St. Minneapolis 707 Market St. St. Louis

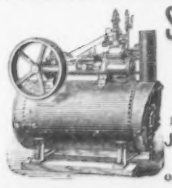
JOSEPH SCHEIDER & CO.
(Successors to MANHATTAN STAMPING WORKS.
Manufacturers of
Plain AND Retinned Deep Stamped Ware,
Tinner's Trimmings, Japanned Ware,
ALSO PLAIN AND EXTRA HEAVY POLISHED WARE.
Nos. 103, 105, 107, 109 North 3d Street,
BROOKLYN, E. D.

We call attention to our line of Watering Pots, on which we quote;

Quarts,	1	2	3	4	6
With Common Tin Roses,	140,	180,	210,	220,	300 pr. doz
With Patent Zinc Roses,	180,	220,	250,	270,	350 "
Quarts.	8	10	12	16	
With Common Tin Roses.....	360,	420,	540,	660,	pr. doz
With Patent Zinc Roses	410,	480,	600,	720,	"

Special prices on large quantities.

COBB & DREW,
PLYMOUTH, MASS.,
Manufacturers of Copper, Brass and Iron Rivets; Common and Swedes Iron Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk, Clout and Cigar Box Nails, &c. Rivets made to order.
NEW YORK AGENCY,
DISOSWAY & HENDERSON,
HARDWARE,
105 GREENWICH STREET.
Agents for the Philadelphia Star Carriage and Tire Bolts



STEAM ENGINES
Upright and Horizontal, Stationary, Portable and Semi-Portable.
3 to 16 Horse Power.
Illustrated Pamphlet Free. Address
JAMES LEFFEL & CO.
SPRINGFIELD, OHIO, or 110 Liberty St., New York

NEW YORK BELTING & PACKING CO.
WAREHOUSE: 15 PARK ROW, NEW YORK.
THE OLDEST AND LARGEST MANUFACTURERS IN THE UNITED STATES OF
VULCANIZED RUBBER IN EVERY FORM ADAPTED TO MECHANICAL PURPOSES

MACHINE BELTING
WITH SMOOTH METALLIC RUBBER SURFACE.
THIS COMPANY HAS MANUFACTURED THE LARGEST BELTS MADE IN THE WORLD FOR THE PRINCIPAL ELEVATORS AT CHICAGO, BUFFALO AND NEW YORK.

STEAM AND WATER HOSE.
RUBBER TEST HOSE,
COTTON "CABLE" HOSE. CIRCULAR, WOVEN, SEAMLESS ANTISEPTIC, FOR THE USE OF STEAM AND HAND FIRE ENGINES, FORCE PUMPS, MILLS, FACTORIES STEAMERS AND BREWERS.

CAR SPRINGS OF A SUPERIOR QUALITY
Original Solid Vulcanite Emery Wheels.
PATENT ELASTIC RUBBER BACK SQUARE PACKING.
BEST IN THE WORLD.
FOR PACKING THE PISTON RODS AND VALVE STEMS OF STEAM ENGINES AND PUMPS.

CORRUGATED RUBBER MATS AND MATTING.
FOR HALLS, FLOORING, STONE & IRON STAIRWAYS, ETC.
JOHN H. CHEEVER, TREASURER.

BRANCHES: 308 Chestnut St., Phila. 52 Summer St., Boston. 203 Nicollet Ave., Minneapolis, Min.
GOULDS & AUSTIN, 167 Lake Street, Chicago.
H. D. EDWARDS & CO., Detroit Mich.

PAGE BELTING COMPANY,

SECTION OF COPPER WIRE-SEWED LIGHT DOUBLE BELTING.

WARRANTED A1 STANDARD MADE BY PAGE BELTING CO.

We manufacture all the staple and special grades of Leather Belting.

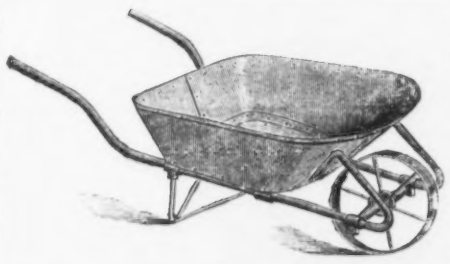
Also the "Hercules" Lacing and the *Patna Brand* Lacing.

MADE BY PAGE BELTING CO. EXTRA. FULLY WARRANTED.

The Hercules is mechanically made; is a buffed lacing; combines the good qualities of ordinary Raw Hide and of Page's Patent. Try it.

Send for Catalogue No. 17, and "*Kinds and Grades of Belting to use for Different Kinds of Work.*"

CONCORD, N. H., U. S. A.



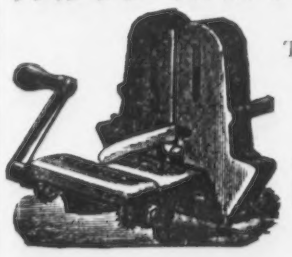
H. A. ROGERS,
No. 19 John St.,
NEW YORK,
RAILWAY AND MACHINISTS' SUPPLIES.
Everything in the line. Write for what you want. Sole agent in the U. S. for J. Moncrieff's SCOTCH GAUGE GLASSES.
SOLE AGENTS FOR TANITE EMERY WHEELS

BUCK BROTHERS, MILLBURY, MASS.
The Most Complete Assortment in the U. S. of
Shank, Socket Firmer and Socket Framing Chisels.
PLANE IRONS.
CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our our trade-mark also, "Riverlin Works."

VARIETY IRON WORKS.
MAIN OFFICE AND FACTORY,
FRANKFORD, PHILADELPHIA.
BRANCH OFFICES,
PHILADELPHIA 413 Commerce St.
NEW YORK 104 Chambers St.
CHICAGO, 89 Lake St.
SAN FRANCISCO, 109 California St

ALFRED C. REX & CO.
MANUFACTURERS OF
Hardware Specialties
AND
Novelties in Iron, Brass and Bronze.
Special attention paid to Electroplating in all its branches.

H. & J. W. KING,
TABLE KNIFE POLISHING MACHINES
GUHL & HARBECK'S PATENT.



These famous Polishers are the best and cheapest for cleaning, polishing and sharpening Table Cutlery.

THE
Francis T. Witte Hardware Co.,
Sole Agents for United States and Canada,
106 Chambers Street, New York.

Pat. Dec. 15, '85.

THE CONROY
Refrigerator Door Fastener.
THE BEST SELLING FASTENER MADE.
P. J. CONROY & CO.,
1605 CATHARINE ST., PHILADELPHIA.
Also a full line of brass and nickel-plated Refrigerator Hinges at lowest prices.
For Sale by Leading Jobbers throughout the United States.

iron. A large proportion of the orders will be executed abroad, in some cases because foreign and especially American brands are indented as for axes, shovels and pumps, and in others for economical reasons, because the Germans can work so much more cheaply than English manufacturers. Wrought-iron tubes are not in such brisk request since the recent advance of prices, which makes the discount on gas-tubes 77½%, but the large firms are still well employed on old orders and special contracts. In connection with the American Exhibition in London, it is interesting to note that some 200 tons of galvanized sheets used in the construction of the building have been supplied by Morewood & Co., Limited, of Birmingham. At Sheffield quietness is the prevailing tone in the trades of the town. The cutlery and plating branches are less actively employed, though there are exceptional cases in which the full swing of brisk trade is being enjoyed. In the heavy trades works engaged on Government war contracts and in railway work are still busily employed, but in plates and other material for ordinary shipbuilding little is doing. Crucible steel makers continue fairly well employed, but there is a relaxed demand for Bessemer and other cheaper steels.

The Use of High Steam Pressures.

In an instructive article on the above subject, the *Locomotive* recently remarked:

Naturally the first difficulty encountered in the use of steam of extremely high pressure lies in the construction of the boiler. If steam users would be content with a small boiler the difficulty would be easily overcome; but they are not. On the contrary, they want the very largest sizes built to carry the highest pressures. As the strength of boiler shells of any given thickness is inversely proportional to their diameters, and the thickness of plates exposed to the action of furnace heat is limited, it will at once be seen that the difficulty is a serious one; a limit is soon reached either in size or amount of pressure that can be safely carried. A large boiler is more economical than a small one for several reasons; for a unit of power developed, it is cheaper in first cost; it requires less space, less brickwork for setting it properly; there are fewer joints, parts and pieces; consequently it costs less to keep it in repair, and as it exposes less radiating surface to the air, a slightly greater degree of economy in the use of fuel may be realized by its use. For example, suppose 100 horse power is wanted, we can get it by using four 36-inch boilers, or one 72-inch boiler. The four small boilers would require a boiler room 39 feet long and 23½ feet wide; the larger boiler, furnishing the same power, would require a room of the same length, but its width would need to be but 10½ feet, less than one-half of that required in the first case, and in many places this would be a most important matter, enough in itself to compel the use of the larger size. The fittings required in the first case, such as piping, gauge cocks, &c., would cost at least three times as much as they would for the large boiler, while about twice as many bricks would be required for the settings. The matter of firing one furnace instead of four possesses such manifest advantages that it is quite unnecessary to draw any comparison between the two cases. The 72-inch boiler has decided advantages in every respect but one; the 36-inch boiler can be built to safely carry a pressure just twice as high as the 72-inch. The 72-inch boiler can very easily be built to carry safely a pressure of 100 pounds per square inch, and the 36-inch 200 pounds. How much can be gained by the employment of this higher pressure? Theoretically a saving of about 12½ per cent. in fuel could be effected by the use of the higher pressure; practically not more than one-half of this, or say six per cent., would be gained. This gain would be more than offset by the greater first cost and cost of maintenance of the high pressure plant.

The following table shows the pounds of steam per indicated horse-power per hour, calculated for various pressures, and also the pounds of coal per indicated horse-power per hour required by a perfect steam engine, working with dry saturated steam, the latter quantity being calculated on the assumption that 1100 thermal units per pound of coal are utilized by the boiler, which corresponds to an evaporation of about 11⅙ pounds of water from and at 212° per pound of coal, a result readily attained under ordinary conditions with good coal. An inspection of the table reveals two interesting facts—first, that at high pressures at great increase of pressure can give but slight additional economy; second, that the performance of the very best modern engines is much below what it would be if no defects existed in the treatment of the steam passing through the cylinder. For instance, at 125 pound pressure, if there were no losses in the engine, ¾ pound of coal per hour would be sufficient to furnish one indicated horse-power; very few engine builders can be found who are willing to put down a steam plant and guarantee an indicated horse power with less than 1¾ pounds of coal per hour.

Table Showing the Steam and Fuel Consumption in a Perfect Steam Engine.

Boiler pressure per gauge.	Temp., Fah.	Lbs. of steam per i.h.p. per hour.		Lbs. of coal per i.h.p. per hour.	
		Non-condensing.	Condensing.	Non-condensing.	Condensing.
300	421.7	10.48	6.16	0.98	0.64
250	405.9	11.19	6.39	1.04	0.66
200	387.6	12.16	6.68	1.13	0.69
175	377.1	12.81	6.87	1.18	0.71
150	365.6	13.63	7.09	1.25	0.73
125	352.6	14.71	7.37	1.35	0.75
100	337.6	16.24	7.71	1.48	0.78
90	330.9	17.05	7.89	1.55	0.80
80	323.6	18.03	8.09	1.64	0.82
75	319.8	18.60	8.19	1.69	0.83
70	315.7	19.25	8.34	1.75	0.84
60	307.1	20.83	8.59	1.88	0.87
50	297.3	22.95	8.92	2.07	0.90
45	292.2	24.53	9.11	2.19	0.91

Briefly, the situation may be stated thus: A pound of coal, if perfectly burned, and all the heat were utilized, would evaporate 15 pounds of water, from and at 212°. The boiler actually does evaporate 11¼ pounds of water under these conditions, hence its efficiency must be 75 per cent., or 75 per cent. of the heating power of the coal is utilized by the boiler. An engine working perfectly would develop one indicated horse-power with 7⅞ pounds of steam (of 125 pounds initial pressure) per hour; the best actual engines consume 17¼ pounds per indicated horse power per hour, hence its efficiency is but 42 per cent., or it utilizes but 42 per cent., or less than one half of the heat passing through the cylinder.

This shows that the boiler as it is is a much more perfect machine than the engine, and that time and money spent in devising boilers to carry very high pressures might possibly be spent to better advantage in improving the performance of the engine—or, in other words, to make better use of what the boiler has already given us. But it must not be inferred from the foregoing that we are advocates of the use of low pressures for driving engines. On the contrary, we advise in all cases where any considerable amount of power is wanted the use of boilers of large size, built to carry the highest pressures consistent with safety. With the best materials at our command at the present time, it is possible to build a boiler of the ordinary form, 6 feet in diameter, which will safely sustain a working pressure of from 100 to 125 pounds per square inch, and be good for many years' service. We believe this is the limit, beyond which it will not be safe to pass without some radical change in the materials of which boilers are made.

Foreign Markets.

FRANCE.

PARIS, May 21, 1887.—*Metals.*—During the week both Copper and Spelter have been in better request, and higher quotations have prevailed for the latter and Tin, while Lead has been dull, but steady. We quote at the close, in francs ₱ 100 kg.: *Copper.*—Chili Bars, 105 @ 107.50; Ingots and Slabs, 111; Best Selected, 114, and Pure Corocoro Ore, 107.50. *Tin.*—Banca, 224; Billiton, 282; Straits, 277.50, and English, 275. *Lead*, 30.50 @ 31.25, and *Spelter*, 38.50 @ 39. *Iron.*—The better feeling continues at St. Dizier, orders being abundant enough to absorb the current output; the demand chiefly runs on special Iron and Sheets, Machine Mixed being comparatively neglected. Foundries continue fully engaged. From Valenciennes it is reported that within the district—*i.e.*, throughout the Northern Department, consumption continues active, but that the difference in freights excludes the Northern makes from the Center and West. Thus not over 14 francs can be got in Central France for Merchant Iron, which would net Northern makers only 12.50 @ 13 francs. The import of *Iron Ore* into France during the first quarter has been even lighter than last year:

	1887. Tons.	1886. Tons.	1885. Tons.
From Belgium	9,322	6,993	32,155
From Germany	99,643	104,772	108,703
From Spain	80,338	96,201	146,094
From Italy	..	1,592	541
From Algeria	15,372	24,848	20,200
From other countries	25	5,827	4,114
Total	198,700	240,625	311,807

—*Moniteur des Intérêts Materiels.*

BELGIUM.

BRUSSELS, May 21, 1887.—*Iron.*—As the strikes in the Coal regions go on, assuming more formidable proportions, and commence invading the Iron districts likewise, both Pig Iron and Finished have been hardening, although business in both has, as may be supposed, slackened in view of the uncertain aspect. A brisk demand nevertheless prevails for beams. To have our even business course at this juncture disturbed by labor troubles is all the more to be regretted as the Transatlantic export demand for Buenos Ayres and other quarters was just setting in vigorously. Following has been the export during the first quarter, in tons:

	1887.	1886.	1885.
Iron Ore	33,725	21,110	46,447
Cast Steel	387	489	316
Steel Rails	13,230	6,561	13,486
Finished Steel, Rolled	5,743	7,239	910
Wrought Steel	372	164	375
Pig Iron	3,178	7,065	1,318
Old Iron	5,059	4,989	873
Iron Wire	1,671	646	437
Iron Rails	5,029	1,853	950
Sheets	10,501	8,198	7,108
Other Finished Iron, Rolled	53,444	52,159	42,437
Nails	2,057	1,535	1,754
Wrought Iron	5,445	5,634	5,502
Castings	3,177	6,669	4,865
Total	142,918	124,321	116,778

It will be seen that Belgian exportation has made good headway.—*Moniteur Industriel.*

GERMANY.

HAMBURG, May 21, 1887.—*Iron.*—The Rhenish-Westphalian Iron market has undergone but little change during the week. If we except the Siegen district, the demand for Pig has not perceptibly abated; it is less for Spiegel for export, but the latter remains tolerably firm nevertheless. Activity in the Finished Iron branch is about the same; a few works are, however, less busy, specifications not coming forward. The prices obtained for Finished Iron are, on the whole, too low still, compared with the raw material, and therefore not very remunerative, so that the differences of freight on long distances are a subject of continual consideration—in other words, it is a close business. As at the same time dealers are still well stocked from low purchases during the winter, the associated rolling mill proprietors continue being underbid by them. Since Pig Iron declined a little recently Thin Sheets are being sold cheaper, say at 130 marks ₱ ton. Stocks are, however, rather reduced, and as the summer demand is usually brisk, they will be easily absorbed. Wrought Iron Sleepers sold through adjudication at 114 @ 115 marks at the works. Car works report a very quiet trade. Brass foundries are doing better than formerly, also for export. German exports during the first quarter:

	1887.	1886.
Iron Ore	402,350	448,830
Pig Iron	58,000	53,860
Merchant	51,000	42,060
Rails	42,780	26,360
Other Railway Material	10,140	9,790
Sheets	10,770	9,140
Wire, Iron and Steel	67,150	67,320
Wire Rods	9,670	8,820
Bridges	1,270	1,860
Wrought Iron Tubes	4,690	3,580
Heavy Castings	5,040	4,020
Light Castings	1,410	15,210
Hardware	1,880	1,650
Total	665,890	702,530

They quote at Dortmund: Spiegel, 51 @ 52 marks; and Wire Rods, 82 @ 85; Steel Rails, 120 @ 125. *Metals.*—The market has been quiet and unaltered. The Mansfield Company produced last year 12,787 tons of Copper, being 152 tons more than in 1885, and 75,271 kg. Silver, against 75,075 in 1885.—*Borsenhalle.*

HOLLAND.

ROTTERDAM, May 17, 1887.—*Tin.*—Our market, in response to the London improvement, has taken an upward turn, Banca spot and next sale advancing to 63.25; Billiton spot to 62.75, and 63 guilders August delivery.—*Koch & Vlaerboom.*

SPAIN.

BILBAO, May 14, 1887.—*Iron Ore.*—Hardly anything has been doing in larger contracts, dealings being pretty much confined to single cargoes at 6/9 @ 7/ for Campanil, and 6/9 @ 6/0 for Rubios Superiores; the actual export has also been lighter. Steamers waiting for cargo have diminished in number. Frequent showers of rain have also been a drawback, and the ore has become damp. Many exporters have consequently desisted from shipping it in that condition. The market closes weaker at 6/6 Rubios. Total shipment to date, 1,681,340 tons, against 1,241,891 in 1886. *Pig Iron.*—Has been in good request for export, and in moderate demand coastwise.—*Bilbao Maritimo y Com.*

BUFFALO HEATING FORGES

FOR

HARD COAL

OR

COKE.

COMPLETE WITH

Revolving Shaker Grates

AND

Blast Gate.

MADE IN

Ten Sizes

AND

Styles

FOR ALL CLASSES OF WORK.

BUFFALO FORGE COMPANY,

BUFFALO, N. Y.

NEW. GOOD. CHEAP.

METALOID Bushed, Self-Lubricating HAY FORK PULLEYS,

INSIDE IRON STRAP AND SWIVEL HOOK.

DESCRIPTION AND PRICE:

Shell, 7 in. Sheave, 4½ x 1½. Hook, ⅝ in.

Style	H,	Maple	Sheave,	*Metaloid*	bushed,	$3.50	per doz.	Net.
"	I,	Lig,	"	"	"	4.50	" "	"
"	K,	Iron	"	Pat. roller	"	6.25	" "	"
"	O,	Maple	"	Wood	"	3.00	" "	"

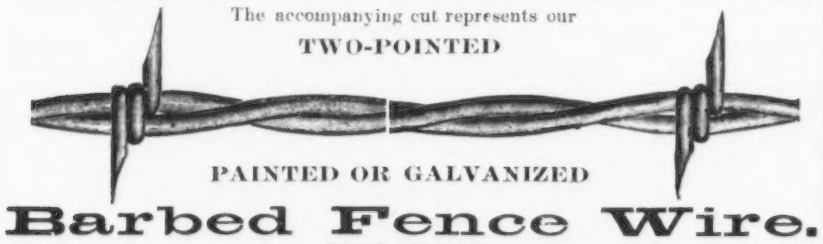
METALOID makes the best bushing for the money yet produced.

Penfield Block Co., Lockport, N. Y.

New York Agency, HENRY B. NEWHALL CO., NEW YORK.

The accompanying cut represents our

TWO-POINTED



PAINTED OR GALVANIZED

Barbed Fence Wire.

MANUFACTURED BY

OHIO STEEL BARB FENCE CO., CLEVELAND, O.

Cut of our four-pointed wire will appear next week. Prices lowest. Quality best. Correspondence solicited.

THE EMPIRE METAL SPIRIT LEVEL, WITH DOUBLE PLUMB.

Glasses are Immovable. No Parts to Work Loose. Glasses Perfectly Protected Made Entirely from One Piece.

Patented Dec. 7, '86.

Send for catalogue and price list.

The Most Durable, Simple in Construction and Cheapest Iron Level on the Market.

Manufactured by GREENE, TWEED & CO., 83 Chambers St., New York.

HUSSEY, BINNS & CO.

(LIMITED),

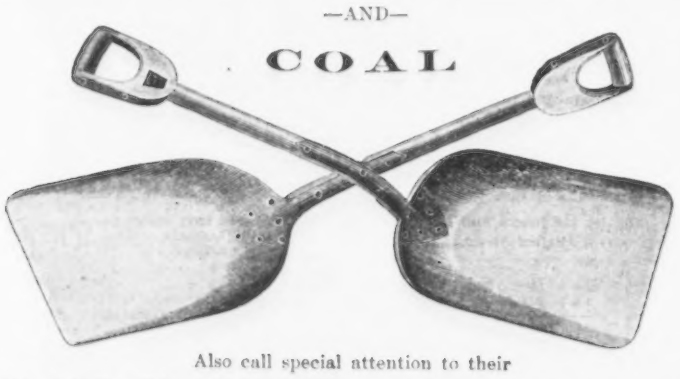
PITTSBURGH, PA.,

MAKE A SPECIALTY OF

Railroad, Contractors' and Miners' Shovels,

—AND—

COAL



Also call special attention to their

NEW PATTERN SMOOTH BACK COAL BARGE SCOOP.

Prices Quoted on Application.

J. C. McCARTY & CO., Direct Representatives,

97 Chambers St. New York.

"EASY" EGG BEATER.

This equals any in durability, while surpasses all in simplicity and the excellence of its work.

A Perfect Beater

AT A

LOW PRICE.

The Easy Beater can be obtained only through the

N. B.—By Act of the Legislature the name of the Ayers Mfg. Co. was changed to

The HAMBLIN & RUSSELL MFG. CO.

WORCESTER, MASS.,

Sole and Exclusive Agents for the U. S.

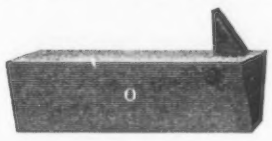
P. F. BURKE,

Successor to C. F. Dewick & Co.,

Manufacturer of

PATENT STEEL

Toe Calks,

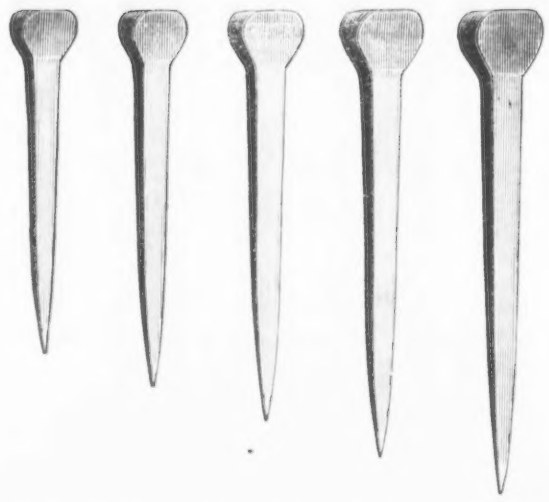


360 Dorchester Avenue, Boston, Mass.

LIVINGSTON HORSE NAIL CO.

104 Reade St., New York,

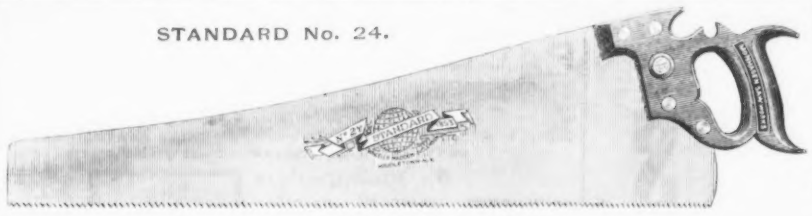
SOLE AGENTS FOR



ANCHOR HORSE NAILS.

HOLLOW THIN BACK.

STANDARD No. 24.



Extra Temper.

Superior Finish.

Patent Handle

The best and cheapest Hand Saw in the market.

LIST, $20 PER DOZEN.

WHEELER, MADDEN & CLEMSON MFG. CO.,

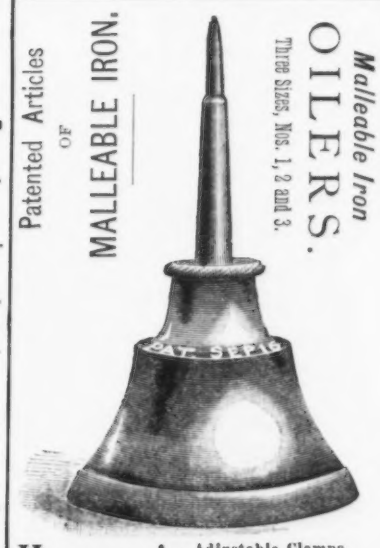
Middletown N. Y.

VIRGINIA NAIL AND IRON WORKS COMPANY,

LYNCHBURGH VIRGINIA.

NAILS and Bar Iron of Superior Finish, made exclusively from Pig Iron.

Patented Articles OF MALLEABLE IRON.



New Improved PATENT *Malleable Iron* OILERS. Three Sizes, Nos. 1, 2 and 3.

Hammer's Adjustable Clamps. Mall. Iron Hand Lamps. M. I. Hanging Lamps.

New Pattern Heavy Screw Clamps.

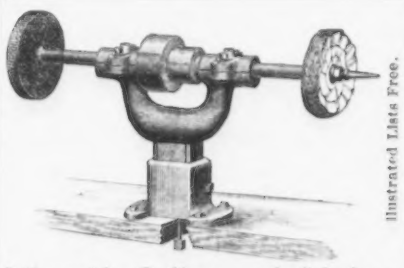
Strongest in the market.

For Sale by all the Principal Hardware Dealers.

SEND FOR PRICE LIST.

MALLEABLE IRON CASTINGS of superior quality, and Hardware Specialties in Malleable Iron, made to order.

HAMMER & CO., Branford, Conn.

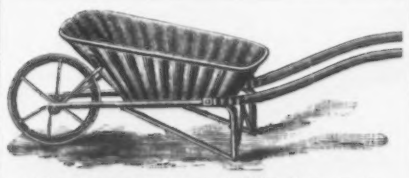


Illustrated Lists Free.

Adjustable Buffers and Grinders,

SPINNING LATHES, CIRCULAR SAWS, &c.

P. PRYIBIL, 467 W. 40th St., New York.



The Strongest and Best Wheelbarrow is

DREYFUS'

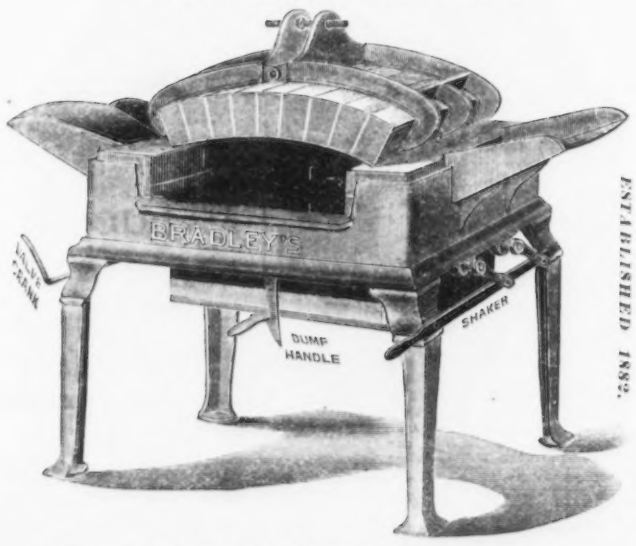
Corrugated Steel Wheelbarrows.

J. G. Dreyfus & Co.,

56 Park Street, New York.

Bradley's Heating Forges,

WITH IMPROVED TOPS.



ESTABLISHED 1882.

For Hard Coal or Coke.

Indispensable in all shops to keep Bradley's Cushioned Hammers and fully employed, and reduces cost of production.

BRADLEY & CO., Syracuse, N. Y.,

and 63 Murray Street, New York City.

CORRUGATED

IRON

ROOFING

SIDING, CEILING, ARCHES AND LATH.

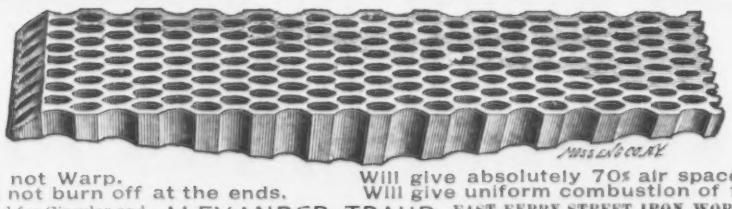
CINCINNATI CORRUGATING CO.

CINCINNATI, O.

SEND FOR ILLUSTRATED CATALOGUE.

CRIMPED

HOOPER'S 70% GRATE BAR.



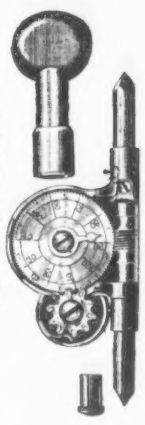
Will not Warp.
Will not burn off at the ends.

Will give absolutely 70% air space.
Will give uniform combustion of fuel

Send for Circular and Price List to **ALEXANDER TRAUD,** EAST FERRY STREET IRON WORKS, NEWARK, N. J.

GEO. W. MONTGOMERY GEO. W. CHURCH

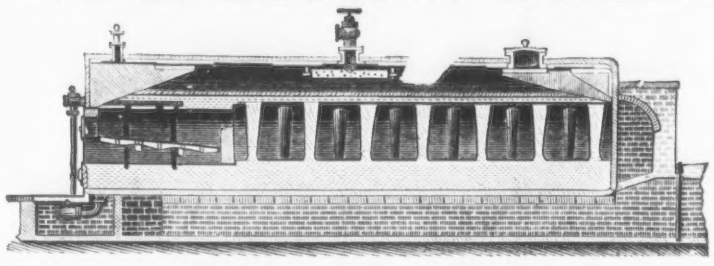
CHURCH'S PATENT IMPROVED
DOUBLE SPEED INDICATOR
Either Right or Left.



MONTGOMERY & CO.,
Importers of Stubs' Files, Tools & Steel,
CORBET SWISS FILES. CHESTERMAN'S TAPES, RULES, &c.
Horse Shoe Magnets. Hubert's French Emery Paper.
WM. SMITH & SONS' CELEBRATED MUSIC WIRE.
105 Fulton Street, N. Y.

NORRISTOWN IRON WORKS,
Manufacturers of
Wrought Iron, Steam, Gas and Water Pipe
from ¼ to 2½ in. inclusive,
JAMES HOOVEN & SON.
Norristown, Pa.
Established 1846.

THE GALLOWAY BOILER.



Safety, Maximum Economy in Fuel, Lowest Cost of Maintenance, Greatest Durability, Large Steam and Water Spaces,
are the Advantages offered by this Boiler.

SPECIFICATIONS AND PRICES UPON APPLICATION TO

EDGE MOOR IRON COMPANY,
POST OFFICE, WILMINGTON, DEL.

WILLIAM SELLERS, Pres't. JOHN SELLERS, JR., Vice Pres't. GEO. H. SELLERS, General Sup't.
WM. F. SELLERS, Secretary, WILLIAM H. CONNELL, Treasurer.

A great improvement over the old style. Prevents slipping from head of the nail. Made of best quality Tool Steel. Carefully tempered. Appreciated and bought at sight by all mechanics. Prices on application. Made only by
The Edward Storm Spring Co., Limited, Poughkeepsie, N. Y.
JOHN A. GRAHAM & CO., 113 Chambers St., New York, General Agents.

EAGLE

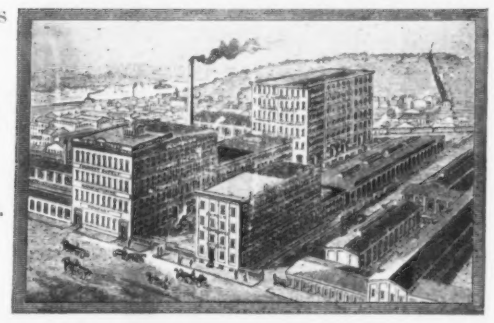
MANUFACTURERS OF AND DEALERS IN ALL KINDS OF

Foundry Facings

Plumbago or Black Lead.

Finest Return and Stove Plate Facing.

Used by all Stove Manufacturers who pride themselves upon the Handsome Castings they make.



THE LARGEST FACING MILL IN THE WORLD
Capacity 650 Barrels per Day.

Foundry Supplies.

Best One-Bag Return and Stove Plate Facing.

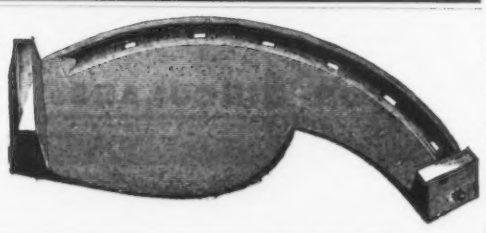
ALSO SHIPPERS OF THE
Celebrated Cincinnati Molding Sand.
MONK'S MOLDERS' TOOLS.

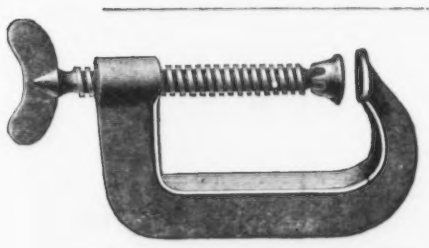
Will pit our "NATIONAL" and "EAGLE" RETURN FACING against any similar Facing manufactured.
FACING MILLS.
No charge for samples. Directions given for use. Send for Illustrated Catalogue and price list.

S. OBERMAYER FOUNDRY SUPPLY MFG. CO., CINCINNATI, OHIO.

ALSO MANUFACTURERS OF THE CELEBRATED
EAGLE PURIFIED FIRE-PROOF STOVE VARNISH.
For Quick Polish in Dry or Damp Weather, for Varnishing Polished Edges of Stoves and for the Preservation of Stoves and all Bright Metals from Rust, it is Superior to all other.

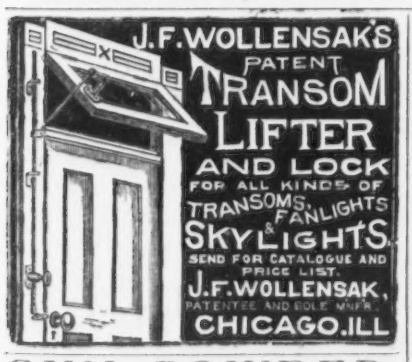
Mount Carmel Ox Shoes,
WITH STEEL TOE CALKS.
The Best and Cheapest Shoes Made.
Warranted to Outwear Any Other Shoe.
Six Sizes Each. Blunt and Sharp Calk.





Eagle Screw Clamps,
WITH
BALL and SOCKET SWIVEL.
Ten Sizes. To Open.
2, 2 1-2, 3, 4, 5, 6, 7, 8, 10, 12 Inches.

Coach & Carriage Hardware & Fine Mountings
Malleable Iron and Brass Castings.
Correspondence solicited.
WOODRUFF, MILLER & CO., Mfrs., Mount Carmel, Conn., U. S. A.



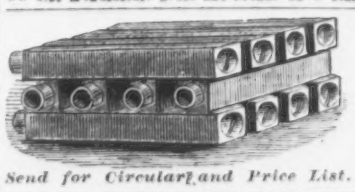
GUN POWDER

LAFLIN & RAND POWDER CO.,
No. 29 Murray Street, New York,
Manufacture and sell the following celebrated brands of Sporting Powder, known everywhere as
Orange Lightning, Orange Ducking, Orange Rifle.
More popular than any Powder now in use.
BLASTING POWDER and ELECTRICAL BLASTING APPARATUS. MILITARY POWDER on hand and made to order.
Safety Fuse, Frictional and Platinum Fuses.
Pamphlets showing sizes of grain sent free.

A NOVELTY IN SHOVELS.
MAYNARD'S
PATENT SOLID CAST STEEL SOCKET
SHOVELS AND SPADES.
Forged from a single piece of Cast Steel, without welding. The best, strongest and handsomest ever made. For sale by
GEO. W. BRUCE,
24 Duane St., New York.

OSBORN M'F'G. CO.
79 TRADE MARK 79
BLEECKER ST. NEW YORK.

The Original Inventors and Manufacturers of the
"OSBORN"
Bright Metal Cages, in Brass, Bronze and Silver Plate.
NEW AND BEAUTIFUL DESIGNS JUST OUT.
We also Manufacture Brass and Bronze Show Stands for Fancy Goods *Catalogues Mailed Free.*



Send for Circular and Price List.
THE WYCKOFF PIPE CO.,
MANUFACTURERS OF
WATER PIPE AND PUMP TUBING,
The BEST and CHEAPEST in the Market.
WILLIAMSPORT PA.

SALEM LEAD CO.,
MANUFACTURER OF
PURE WHITE LEAD, Lead Pipe and Sheet Lead.
SALEM, MASSACHUSETTS.

FOR FINE CUTS SEND TO KYES & WOODBURY, ENGRAVERS WORCESTER, MASS.

Wages in Sheffield.

The *Engineer* publishes the following interesting statement on wages in Sheffield as one of a series of similar articles:

The prosperity of Sheffield is principally dependent on the manufacture of steel and the application of it to various uses. Up to the present time Sheffield retains its supremacy in steel manufacture, especially in heavy descriptions, notwsthstanding foreign competition. The heavy branch of the steel manufacture includes armor-plate, axles, large castings for engines, rails, steel shot, steel for rifles and tires. The cutlery trade embraces almost every variety of instrument and tool, edge tools, engineering tools, hammers, knives, mathematical instruments, saws, scythes, shovels, spades, surgical instruments, brass, &c. The manufacture of engines and machinery is also largely carried on. Among other industries may be enumerated bicycle making, brass founding, iron founding, and manufacture of grates and stoves. The cutlery of Sheffield manufacturers is not all made upon their ownpremises. A very considerable proportion is given out to workmen, who hire small premises and who work for different makers, or work is contracted for by "little masters," who employ few men, have inexpensive places, and work for small profits. They have usually but little capital, and are liable to fall into difficulties, and thus to become dependent upon those who employ them. From these causes it is difficult to say what goods of a particular pattern cost, different makers varying in their estimates. The feeling between employer and employed may be said to be an armed neutrality tending to more or less friction or jealousy, but not seriously hindering the prosperity of the various branches of trade. Organizations for their own protection exist among the workmen in nearly all trades, though much of their power has been diminished, and lockouts and strikes are fewer.

Wages paid per week in iron forges, foundries, and machine shops in Sheffield.

	Hours.	Lowest.		Standard.		Highest.	
		s.	d.	s.	d.	s.	d.
Ball furnacemen	50	.....		50		8	
Underhand	50	25		4 30		5 36	6
Charcoal lumpers	50	.....		60		10	.....
Puddlers	50	.....		32		5 33	5
Underhand	50	.....		22		3	.....
Shinglers	50	50		8 53		9 60	10
Assistant	50	33		6 37		6 40	7
Bogiemen	55	.....		25		4	.....
Firemen	55	30		5 35		6 45	7
Forgemen	55	50		8 60		10 76	0
Furnacemen	55	55		9 60		10 76	0
Hammer drivers	55	.....		30		5	.....
Iron trailers	55	12		8 16		3 21	3
Levermen	55	.....		32		11	.....
Plate rollers	55	60		8 65		10 81	1
Rollers	55	40		7 45		7 60	10
Assistants	55	27		4 30		5 33	4
Scale melters	55	.....		35		6	.....
Metal refiners	57	.....		45		7	.....
Tire rollers	57	55		9 56		9 60	10
Apprentices — according to age	54	5		1 9		2 12	2
Blacksmiths	54	30		5 31		5 35	6
Fettlers	54	26		4 26		10 28	4
Fitters	54	34		5 35		6 36	6
Machinists	54	24		4 32		5 36	6
Millwrights	54	26		4 30		5 33	5
Molders	54	34		5 35		6 38	6
Pattern-makers	54	32		5 32		11 34	5
Pattern-makers	54	30		5 32		5 34	5
Turners	54	24		4 32		5 36	6
Laborers	54	18		3 21		3 25	4
Boilermakers' apprentices	54	5		1 6		7 10	2
Backers	54	28		4 30		5 31	5
Blacksmiths	54	25		4 27		4 30	5
Enginemen	59	25		4 26		4 30	5
Flangers	54	27		4 28		4 30	5
Holders-up	54	20		3 21		3 23	4
Rivet boys	54	5		1 5		7 6	1
Riveters	54	28		4 30		5 31	5
Laborers	54	18		3 18		9 20	3

Wages paid per week to railway employees in Sheffield.

Carriage examiners	72	25		4 26		4 30	5
Fitters	66	25		4 28		4 35	6
Wagon examiners	72	25		3 26		3 30	6
Laborers	72	16		3 18		3 20	3

Wages paid per week in steel works in Sheffield.

Converting foremen	45	.....		30		5	.....
Laborers	45	.....		20		3	.....
Melting:							
Cellar lad	60	5		1 7		7 15	3
Cokers	60	18		3 20		3 21	3
Pot-makers	60	30		5 35		6 39	6
Pullers out	60	28		4 29		5 30	5
Teemers	60	35		6 36		6 40	7
Rolling foremen	48	.....		45		7	.....
Rollers	48	.....		36		6	.....

Wages paid per week in the manufacture of cutlery, tools, &c

	Lowest.		Standard		Highest.	
Edge tools: Piecework						
Forgers	40	7	42	7	55	8
Grinders	40	7	48	8	60	10
Hardeners	26	4	28	4	30	5
Strikers	30	5	35	6	45	7
Files:						
Forgers	30	5	35	6	45	7
Grinders	35	6	40	7	55	8
Hardeners	26	4	27	4	30	5
Strikers	25	4	28	4	35	6
Saws:						
Grinders	45	7	46	8	55	8
Handlemakers	30	5	32	5	40	7
Hardeners	26	4	28	4	30	5
Smiths' circular saw	30	5	35	6	45	7
Smiths' long saw	30	5	35	9	45	6
Smiths' short saw	30	5	31	5	35	6
Sheep-shears:						
Benders	28	4	31	5	32	5
Forgers	35	6	38	6	40	7
Grinders	35	6	38	6	40	7
Assistant	18	3	21	3	25	4
Hardeners	26	4	28	4	30	5
Strikers	25	4	26	4	30	5
Cutlery, pocket:						
Blade forgers	20	3	35	6	50	8
Grinders	25	4	37	2	50	8
Putters together	15	3	25	4	40	7
Cutlery, table:						
Forgers	20	3	36	6	40	7
Grinders	35	6	40	7	50	8
Hafters	25	4	26	4	30	5
Strikers	25	4	26	4	35	6
Forks, steel:						
Filers, women	7	7	8	7	10	8
Forgers	24	4	25	4	30	5
Grinders	24	4	25	10	35	6
Razors:						
Forgers	40	7	46	8	50	8
Grinders	50	8	55	8	60	10
Setters in	25	4	28	4	35	6
Strikers	30	5	36	6	40	7
Scissors:						
Filers	25	4	26	4	30	5
Forgers	30	5	32	5	40	7
Grinders	40	7	43	7	45	7
Hardeners	26	4	27	4	30	5
Holers	26	4	27	4	30	6

In this district co-operative societies have been moderately prosperous. They offer great advantages in the purchase of the necessaries of life, and they would prove a great benefit to the laboring classes if they could be induced to avail themselves of the opportunity. Rents vary according to locality. The dwellings of a large number of the working people in the older parts of Sheffield consists of two rooms, one below and one above, with an attic. These are often situate in back alleys and crofts where the sanitary conditions are unfavorable, and let for 3/2 a week. The modern improved industrial dwellings consist of two rooms below and bedrooms above, with an attic, at a rent of from 3/8 to 4/2 a week, according to locality. The average rent of four-roomed houses is from 3/7 to 5/1 a week. Houses of six rooms are from 4/8 to 7/ a week. Coal is from 10/2 to 15/3 per ton. Gas is 2/2 per 1000 cubic feet.

Examples of Cost of Living per Week in Sheffield.

	3 in family		4 in family	
	s.	d.	s.	d.
Bread and flour	2	1	4	1
Butter, cheese, coffee, milk sugar, tea, &c	5	11	2	6
Meals	2	1	4	0
Vegetables	0	10	1	6
Fuel and light	1	5	1	6
Clothing	2	1	3	7
Rent	4	2	4	1
Total	18	7	21	3
Income	20	10	25	4

The Burlington Brake Tests.

Of the Burlington brake trials, which are now virtually ended, the *Railroad Gazette* says:

They have shown considerable improvement in the means of controlling the speed of long freight trains, but perhaps the most remarkable feature has been the general adoption of electricity, which has been proved capable of operating the valves of air brakes so as to secure greater quickness of action, less shock and greater graduation of the power applied. The action of electricity may be uncertain, but in the trials it has given no trouble when properly fitted under the supervision of an electrician. The failures of the Park brake were chiefly due to the defects in the mechanical apparatus. The defect in electric application arose simply from careless insulation. The trouble with the electric apparatus in the Eames brakes is accounted for by the fact that it was fitted by an engineer, and not by an electrician. There appears to have been no defect in the electrical appliance of Westinghouse and Carpenter, and it is significant that the only brake not using electricity, the Hanscom, will be brought forward, as the inventor states, at any future trials, with electric attachments. It is objected that electricity may fail without warning, and destroy the power of stopping quickly. But the air brake will still remain in full force, and perhaps be quite as available as if there were no electrical attachment. Of course the distance in which the stop could be made would be longer than with electricity in use, and the stop would be attended with more shock. If the hose bursts or the train breaks in two the brakes are still applied automatically by the air, as shown in the break-away tests of the Westinghouse, Eames and Carpenter.

One of the objections to the use of electricity would be removed by working with closed circuits. Then any failure of the current, or short circuiting, would automatically apply the brakes. But this would lead to additional delays on the road, and brakemen would find it difficult to discover the cause or locate the defect. An electrical objection to closed circuits is that the battery must be constantly running, causing greater expenditure and requiring frequent renewals; while with the open circuit a small storage battery will last a month, at least, as the current is only used for momentary application of the brakes. This last objection of uneconomical use of the battery power does not obtain against the Card system, where one battery on the engine and one in the caboose, normally both on the same circuit, are opposed to and balance each other. The current in this case is used only when brakes are applied, by cutting out one battery, when the unbalanced current from the other battery applies the brakes, and graduation is effected by cutting out one or more cells instead of the whole battery. It is a pity that the mechanical defects of this apparatus did not permit the electrical features to be thoroughly tested.

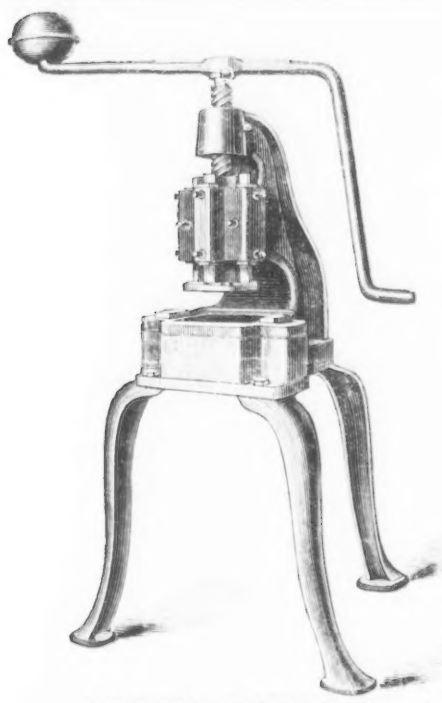
Mr. Westinghouse does not believe that electricity is sufficiently reliable, and proposes to use it only for emergency stops, and does not profess to adopt it for graduating. He uses only three or four electric valves in a long train. These valves are placed in the couplings and let out the air, virtually dividing a 50-car train into four 12 car trains, the air being let out at each electrical valve as it is now done at the engineer's valve. So few valves being used there is, of course, less chance of failure. On the other hand, Carpenter manipulates his brake entirely by electricity, applying, releasing and graduating the brake pressure, and the trials show that this can be done successfully. The triple valve in each car being moved instantly, the full pressure in each cylinder is attained in a shorter time than with any of the other apparatus tried, as shown by the brake-beam pressure diagram in another column. It is claimed that experience with train signaling shows electricity to be an unreliable agent for use on trains. But when we consider the great variety of purposes for which it is now used, the constant increase of its application and the very rapid growth in electrical art in all directions, it does not seem very sanguine to prophesy that it may be successfully used in train braking.

A very noteworthy feature of these tests is the entire absence of buffer brakes, which will now probably sink into oblivion. The absence of the three buffer brakes, the withdrawal of the Card electrical and the Hanscom air-brake, and the decision of the American not to exhibit, have left only three competitors—Carpenter, Eames and Westinghouse. We defer any analysis of the relative merits and demerits of these brakes until the special trials now in progress at Burlington are completed. In them some special features of practical importance will be tested, and changes and improvements that the general test have shown desirable will probably give some interesting results.

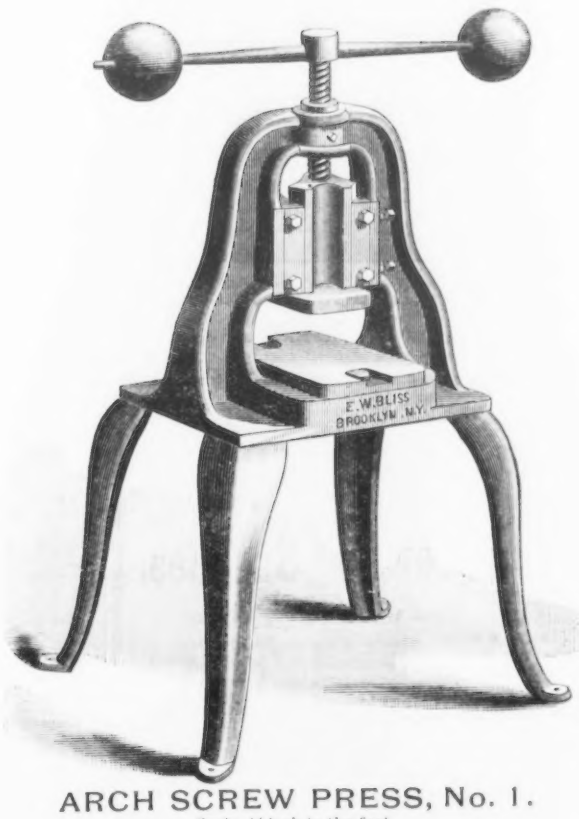
E. W. BLISS CO.,

No. 17 Adams Street,

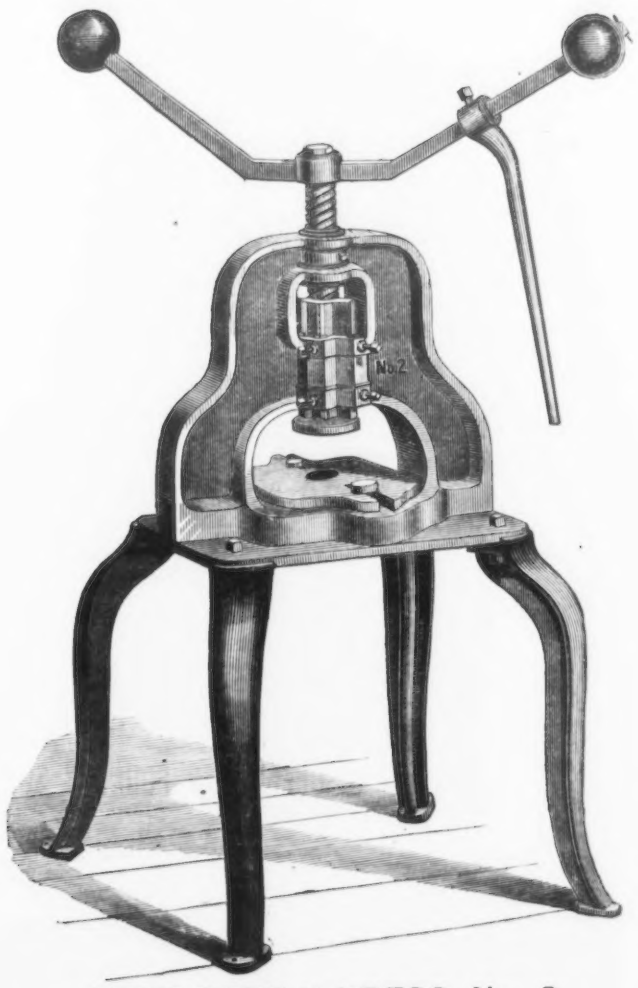
Brooklyn, N. Y.



SCREW PRESS, No. 1.



ARCH SCREW PRESS, No. 1.
Scale, ¼ inch to the foot.



ARCH SCREW PRESS, No. 2.

Builders of

Drawing Presses.
Power Presses.
Foot Presses.
Drop Presses for Forging and Stamping.
Double Seaming Machines, for round, square and oval work.
Circular Shears, Hand and Power.
Squaring Shears, Foot and Power.
Canning Machinery.
Dies of every description.
Tools for working Sheet Metals.
Petroleum Can Machinery.
Special Machinery.

SEND FOR CIRCULARS.

HEAVY STEEL

— AND —

Iron Plates

— AND —

CYLINDERS

For Screening Ore, Coal, Stone, Phosphates, &c

Revolving Screens,

Round and Hexagon.

Grizzlies

FOR

Placer Mining.

STAMP

Battery Screens

Of all kinds and sizes.

Mining Screens

For all kinds of Ores.

FOR

Cotton Seed Oil Mills, Rice Mills, Sugar Houses, Distilleries,

PHOSPHATE and FERTILIZING WORKS,

Elevators, Malt Kiln Floors, Grain Dryers, Threshers, Separators, Corn Shellers and all kinds of Grain Cleaning Machinery; also for Mining and Concentrating Works; Coal, Coke and Ore Screens; Gas and Water Works; Paper, Woolen, Flour and Oil Mills; Filters, Strainers, Ventilators, &c. Special attention given to work for Railroads and Car Builders. Perforated Tin and Brass of all sizes. Iron, Steel, Copper, Brass and Zinc punched to any size and thickness required.

CORRESPONDENCE SOLICITED. SATISFACTION GUARANTEED.

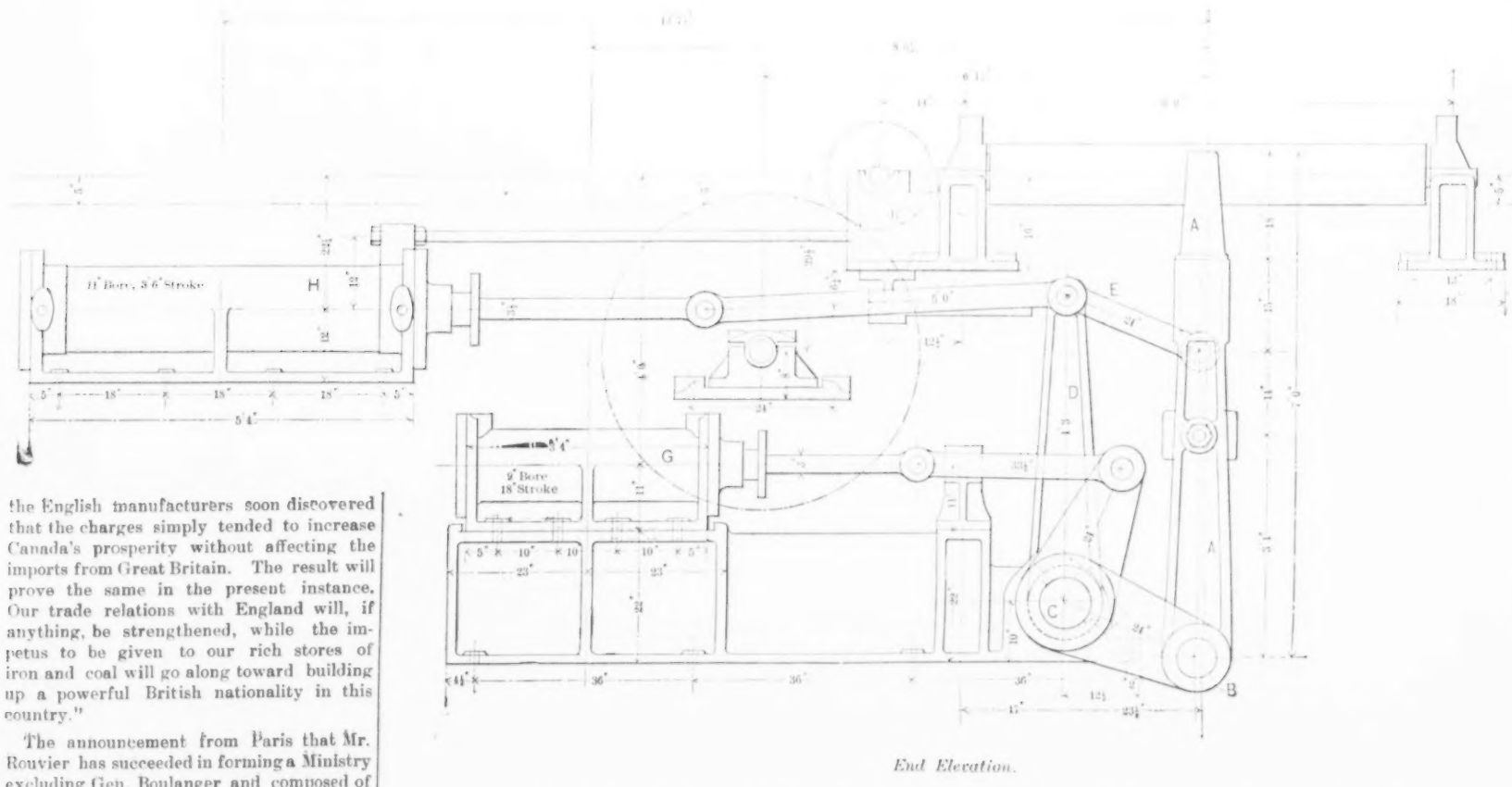
The HARRINGTON & KING PERFORATING CO.,

MAIN OFFICE AND WORKS:
224 & 226 NORTH UNION STREET, CHICAGO.

BRANCH OFFICE:
100 BEEKMAN STREET, NEW YORK.

The Robinson-Rea Ingot Manipulator.

The Robinson-Rea Mfg. Company are now building for a 32-inch mill an ingot manipulator, the drawings of which we present on this and the first page. The arms A are keyed upon the shaft B and rigidly braced together. B is journaled in the ends of the arms F, which are in turn keyed on the shaft C, which shaft is rotated by the hydraulic cylinder G. A second hydraulic cylinder, H, gives to A a sweeping motion across the roller table, and, by bringing A under the edge of the bloom, the latter may be turned over by operating cylinder G. The radius arms D rotate loosely upon C, and, with link E, give a parallel motion to A in lifting. The arms A are furnished with caps, A, to replace cheaply in case of breakage. It will be noted that the entire apparatus has the merit of being simple and has the strength which this class of work requires.



INGOT MANIPULATOR, BUILT BY THE ROBINSON-REA MFG. COMPANY, PITTSBURGH.

THE WEEK.

Respecting the protest of British manufacturers against Canada's iron duties, Sir Charles Tupper, Minister of Finance, is represented as saying in a recent interview: "No further charges will be made, despite the representations made to the Colonial Secretary. A similar protest was made in 1879, when the tariff regulations went into effect, but it was only temporary, because the English manufacturers soon discovered that the charges simply tended to increase Canada's prosperity without affecting the imports from Great Britain. The result will prove the same in the present instance. Our trade relations with England will, if anything, be strengthened, while the impetus to be given to our rich stores of iron and coal will go along toward building up a powerful British nationality in this country."

The announcement from Paris that Mr. Rouvier has succeeded in forming a Ministry excluding Gen. Boulanger and composed of Moderates who favor peace, was received in Berlin with satisfaction, qualified by fears that the existence of the new Cabinet would be stormy, soon ending in a more acute crisis.

Wm. J. Harlan, a well-known mining engineer and wholesale coal merchant, died in this city last week, aged 63 years. He was lately engaged in developing a mine at Ellenville, New York.

The Suez Canal directors report a considerable falling off, both in vessels and tonnage, for last year compared with 1885. The number or vessels was less by 524, the net tonnage showed a decrease of 568,097 tons, and the transit receipts a decrease of 5,680,049 francs, the same rate of dues being levied for both years.

It is reported from the lakes that railway companies with water connections find it necessary under the operation of the Interstate law to enlarge their marine outfit, and that shipbuilders are pressed with orders as never before. The increased propelling power of the newly built lake steamers develops a speed in sharp competition with railway trains. Twice thus early in the season has the best previous record been surpassed, freight being delivered at Cheboygan, Mich., in about four days from New York.

The legal authorities of St. Louis sustain the local assesssors in their decision to tax the stock of foreign corporations held by residents in that city, notwithstanding the intimation that a number of wealthy capitalists would seek relief by removing to New York.

The recent forest fires in Michigan are said to have caused a loss of $7,000,000 in values and eight human lives.

The New York Industrial Education Association, whose building is on University Place, report remarkable success. They now have under instruction 4383 pupils, the number having more than doubled within a year. The regular classes in the building comprise nearly 1000 pupils, of whom 65 have been teachers. Six of the classes are in carpentry.

The scheme broached in the Legislature of this State with reference to measures for the eventual consolidation under a single municipal government of the cities of New York and Brooklyn anticipates an event which cannot long be postponed. Very soon the two cities will be practically united by bridges of steel and iron across the East River, which will no more constitute a dividing line than does the Thames in the city of London

Rich brick-making clay under the bed of the Hudson River at Haverstraw is to be made available through the use of coffer dams, the surface material having been principally exhausted. When the new plan is perfected Haverstraw, it is promised, will lead all other places in the manufacture of bricks.

A national assembly of iron workers is proposed, with the approval of Mr. Powderly and his executive board. Notices have been sent to the organized iron and steel workers of the United States, in which it is suggested that a national convention be held at Harrisburg, in the National Hall, commencing June 4.

It is now said that all impediments to the construction of the Harlem ship canal have been overcome, and that work will soon commence. It is expected that the grain and lumber trade will be more immediately affected.

A cable dispatch says: "The disgraceful disclosures as to the bending and telescoping of bayonets have quickened the sense of responsibility of the British War Office, and a contract has just been awarded to Wilkinson & Son, of Pall Mall, for 150,000 Enfield-Martini sword bayonets of a light and strong pattern, to which the severest tests have been applied. A blade having a weight of under 1 pound is capable of standing a pressure on the point without deviating from the perpendicular of 160 pounds. The old bayonets could only stand a pressure of from 40 to 50 pounds. The new blades before being issued will all be tested by machinery."

Plumber Thomas F. Harrington, of Brooklyn, and several of his men were arrested upon a charge preferred by J. F. O'Brien, a contractor, who is erecting a number of buildings. The alleged offense was causing the union mechanics to leave their work, the latter refusing to co-operate with the former in following their trade. A suit for false imprisonment is in prospect.

A considerable accumulation of iron ore has taken place on the docks at Cleveland in consequence of the strike of dock hands at that port, which commenced nearly one month ago. Italians who were brought from a distance were induced to leave, and other devices designed to remove the obstructions to trade have thus far been unavailing.

The report of Consul Griffin, of Sydney, on the new tariff of New South Wales states that American locomotives and American machinery and appliances are likely soon to supersede all others in Australia.

A syndicate to control the phosphate trade of Charleston is being formed, with the object of advancing prices. The value of the phosphate rock excavated last year was $2,000,000, representing 500,000 tons.

According to the returns received by the Department of Agriculture, the total arrivals in the Dominion from January 11, 1887, to April 30 last were 30,844, as compared with 22,723 in the corresponding period of last year. Of the total, 17,609 settled in the Dominion.

The New Zealand Loan and Mercantile Agency estimates the probable wheat surplus for foreign export from the Australian colonies to be 8,200,000 bushels.

The lines in competition with the Canadian Pacific from San Francisco to Omaha have cut rates on sugar to force the Canadian Pacific out of the traffic which it has secured by previous reductions. Of wool transportation, the Chicago *Times* says: "Although the Canadian Pacific made a bid with a low rate for the wool traffic of the Pacific coast, it failed to secure any large part of it. This was due to its inability to guarantee that the goods would be taken through Canada without the demand for a payment of duties or vexatious delays at the Custom Houses. The wool rate, which was $3 under the transcontinental tariff of April 27, is now $1.50, San Francisco to New York or Boston, all rail."

California rejoices in the prospects for abundant fruit and grass.

The General Executive Board of the Knights of Labor have decided to personally investigate the strike in the coke regions, and endeavor to effect an amicable settlement.

At Sabine Pass, on the Louisiana coast, 14 feet of water have been secured by the Government, affording an outlet to a great timber region and rich cotton lands.

The canal and river counties of the State of New York pay nearly 85 per cent. of all the State taxes, and the freedom of navigation within the limits of the State is one of the most trusted resources of wealth which is constantly menaced by railroad rings and their allies at the capital. The suggestion that a league of these counties for no other object than the preservation of these menaced interests has at least the merit of novelty.

Efforts are making to work up an interest in a World's Fair for 1892, the fourth centennary of Christopher Columbus's great discovery, but thus far little progress has been made.

The State cannot tax the receipts of interstate steamship companies. The Supreme Court at Washington so decided in the case of the Philadelphia and Southern Mail Steamship Company *vs.* the Commonwealth of Pennsylvania. The Court, in a long and careful opinion by Justice Bradley, decides that the State cannot impose such tax for the reason that it would be regulation of interstate commerce. This decision, so far as it relates to taxation of interstate commerce carried on by corporations, applies equally to domestic and foreign corporations. The capital stock of the former, regarded as inhabitants of a State, or their property, may be taxed as other corporations and inhabitants are, provided no discrimination is made against them as corporations carrying on foreign or interstate commerce so as to make the tax in effect a tax on such commerce but their business as carriers in foreign or interstate commerce cannot be taxed by a State under the plea that they are exercising a franchise. The judgment of the Supreme Court of Pennsylvania is reversed.

The great Chicago wheat corner in which Armour & Co. are supposed to be engaged, makes it necessary to provide more storage room, and plans have been drawn for a new elevator, on Goose Island, of 4,500,000 bushels capacity. The vast volume of wheat which for years has been converted into flour at Minneapolis now looks to Chicago for storage, the mills being subjected to enforced idleness, owing to the high price of wheat resulting from speculative hoarding.

The Postmaster-General believes that under the proposed parcel post arrangement, for which overtures have been made to 15 of the Central and South American Governments, communications through this channel will in a few months become very extensive and important.

"The ore shipping season," says the Chicago *Times*, "has begun in earnest. The mines are sending from 10,000 to 15,000 tons of ore daily to the docks at Marquette and Escanaba."

Los Angeles is especially favored as the birthplace of viticulture in California. The city itself not long since might be termed a "city of vineyards." Los Angeles County in 1886 yielded 4,000,000 gallons of wine as the product of the vintage. The raisin crop was 200,000 boxes, while 300,000 boxes were shipped thence last year, showing that this is becoming, as well as a raisin-producing section, a center of the raisin trade. Its petroleum resources promise to be unrivaled in America, as wells have been recently tapped yielding 600 barrels per day.

Under the recent orders of Secretary Lamar 25,000,000 to 30,000,000 acres of railroad indemnity lands will be opened to public settlement.

When the two railroads now building in the Gogebic iron range of Michigan are completed, the movement of ore will no longer be limited to shipping facilities via the lakes.

A $1,000,000 bridge is proposed for the Panhandle Railroad, about 4 miles out of Pittsburgh.

The corner-stone of the Labor Temple to be erected in Minneapolis was laid on Sunday with imposing ceremonies. It will be a white brick structure four stories high; ground dimensions, 132 x 80 feet, and the estimated cost is $100,000. It will have a spacious auditorium capable of seating 2000 persons, besides furnishing headquarters for various labor organizations.

The Treasury Department is building a specie vault in Washington City 90 feet in length, 50 feet wide and 12 feet high, of a capacity sufficient for the storage of 100,000,000 silver dollars. The walls will be of brick 4½ feet thick, and the interior form 16 cells separated from each other by a longitudinal corridor of iron lattice work. The estimated cost of the iron work is $15,000.

Compartment bulkheads and doors to close them, as now constructed, are a vast improvement on those originally built for ocean steamers. The new steamship Trave, for the North German Lloyd, has many improvements. All compartment bulkheads are closed with water-tight steel and iron doors, that are so arranged as to cut through any obstacle, such as coal or wood, that may obstruct their closing. The doors are opened and closed from the deck, and an indicator under the eyes of the officer of the deck shows the officer whether the doors are open or shut.

No legal impediment to the construction of the proposed Blackwell's Island bridge across the East River now exists, Congress and the State Legislature having given all needed sanction. The approach on the New York side will be near Sixty-fourth street, from whence connections with the elevated roads will be easy. On the Brooklyn side the region beyond Hunter's Point is likely to fill up with buildings suitable for workmen, who prefer private habitations to tenement life. Thus railways and bridges effect a more ready dispersion of population and afford relief from the evils of a crowded tenement existence. When the new bridge to Long Island will be commenced is uncertain.

A bill for the encouragement of mining industries in Mexico, now in the hands of the President for his signature and to take effect July 1, is of special importance. From the date of the promulgation of this law coal mines of every variety, petroleum wells, mines of quicksilver, iron and all the mineral products of the same, ore blooms, pig iron, ingots, plates and quicksilver shall be exempt from Federal, local and municipal tax or contribution other than the stamp tax, and the circulation of gold and silver in the republic, whether in bullion or coined, and all other metals, products of the mines of the country, shall be exempt from State tax or toll, no matter under what name the same may be levied. Foreign quicksilver shall remain exempt from all import duties and interior charges of whatever name, with the exception of the coinage tax. The mines and their products shall be subjected to but one tax, which shall be determined by the value of the product, regardless of the cost of extraction, and shall never exceed 2 per cent. of that value. Mills, smelters and assay offices shall pay to the State or Federal Government, as the case may be, only a single tax. Every other tax, except the stamp tax, by whatever name it may be known, or the extract, product or use of the mine or mill, or the product or use of metallurgical industries or the capital invested in mines or mills, shares of stock and title deeds or transfer deeds to mines or mills, and on all shares of stock representing the capital invested is positively forbidden by this law.

Mexicans are introducing farming implements, machinery for cotton manufacture, and mining, and a correspondent down there speaks of a large opening for wood working machinery, on account of the fine resources of Mexican forests. The removal of the duty on barb wire should encourage large importations, as this is an article of which Mexico is in great need.

Out of 132 New Haven journeymen plumbers on strike 120 have voted to continue out until they are successful. The carpenters and painters are also on strike for the adoption of the nine-hour rule. Building operations are paralyzed.

The Panama Canal builders are inundated by a mountain torrent which filled an excavation made at the cost of several million dollars. The Chagres River in the rainy season is likely to be far more destructive.

The New York Legislature adjourned on Thursday, May 26, after a session of nearly five months. The annual tax bill as passed imposes a tax of 2.70 mills per dollar of valuation, as against 2.96 last year. This 2.70 mills is divided as follows: For school purposes, 1.1 mills; for canal sinking fund, 0.24 mills; for canal maintenance, 0.25 mills; for canal improvements, 0.21 mills; for the general fund, 0.90 mills. The amounts required to be raised are as follows: For schools, $3,547,150.08; for the canal sinking fund, $773,923.76; for canal maintenance, $806,170.59; for canal improvements, $677,183.29; for the general fund, $2,902,214; total, $8,706,641.83. Vicious legislation in several instances is more than suspected, in proof of which reference is made to the favor shown to the Metropolitan Transit and Cable Railroad jobs, confirming and extending the privileges of the Poughkeepsie Bridge Company, passing the Subway bill in the form desired by the electric companies instead of that asked for by the city authorities, &c.

The Belt Line stables, on Tenth avenue, in this city, together with 1185 horses and 145 cars, comprising the entire equipment of the road, were destroyed by fire last week, involving a loss estimated at $765,000. Twenty-four dwellings and other property, to which the fire extended, increase the loss to $1,000,000. As it is impracticable to render buildings of this character indestructible by fire, it is at least a reasonable precaution to divide them into compartments by means of brick walls or fire-proof bulkheads, which would, in any case, allow more time for the rescue of the imprisoned animals.

A double track railway from the ore docks in Cleveland to the mills at Youngstown, length 80 miles, will soon be constructed, at a cost of $1,000,000. Of the 68 miles between Youngstown and Pittsburgh 13 are already double-tracked.

The extension of the Brooklyn waterworks system is urgently demanded by the chief engineer.

Chicory as a substitute for coffee becomes more prominent as a consequence of the high prices demanded for the product of Brazil and Java under speculative combinations of merchants in the trade. The "black coffee" served at many of the high-class restaurants is sometimes made entirely of the root. In Germany 35 per cent. of chicory is added to the coffee, and in France over 40 per cent. In the United States for general use but 4 per cent. In almost quite all of our penal and charitable institutions the "coffee" drank on the premises is made from roasted hard tack, rye or peas, with a small percentage of chicory to give it a coffee flavor. Chicory is largely cultivated in Belgium and France, but the Province of Magdeburg, in Germany, produces it the more abundantly.

Palmer's cooperage in Brooklyn, together with the Erie freight house and the Chicago beef house adjoining, were destroyed by an incendiary fire which broke out on Saturday night, and again on Sunday, and the watchman in charge was burned to death. The buildings contained 150 carloads of staves and 1500 barrels of sugar and other merchandise. Two brothers named Johnson, formerly discharged from the cooperage for deculation, confess to having caused the fire, and are in confinement on charges of arson preferred by the fire marshal.

J. C. McCARTY & CO.,

J. C. McCARTY.
WM. H. LITTELL.

Hardware Manufacturers and Manufacturers' Agents,

T. P. BURKE.
JAMES SURPLESS

97 CHAMBERS ST. AND 81 READE ST., N. Y.,

REPRESENTING:

WHITEHEAD BROTHERS,
RUBBER BELTING, PACKING, HOSE, &c.

Cincinnati Barbed Wire Fence Co.
BARBED WIRE.

NATIONAL HORSE NAIL CO.,
"Champlain" Forged Horse Nails.

Winsted Edge Tool Works,
"WITHERBY" CHISELS
AND
DRAWING KNIVES.

AUBURN MANUFACTURING CO.,
HOES, FORKS, RAKES, SCYTHES, &c.

HUSSEY, BINNS & CO,
SHOVELS, SPADES
And Scoops.
Railroad Shovels and Scoops a Specialty.

ARCADE FILE WORKS,
FILES AND RASPS.

Essex Horse Nail Co.,
ESSEX AND LYRA NAILS.

W. A. IVES & CO.,
Augers and Bits, Braces, &c.

Pennsylvania, Continental and Quaker City Lawn Mowers.

ENTERPRISE MFG. CO. OF PENNSYLVANIA,
Sad Irons, Coffee Mills, Choppers, &c.

BUFFALO FORGE CO.,
FORGES, BLOWERS, CAST BUTTS, &c.

LAKE ERIE IRON CO.
All Kinds of Bolts and Nuts.

LINDSAY & McCUTCHEON,
Strap and T Hinges, Washers, &c.

FISHER & NORRIS,
Eagle Anvils and Chain Vises.

NORTH INDIANAPOLIS CRADLE WORKS,
Grain Cradles and Scythe Snaths.

A. E. DEITZ,
FINE LOCKS AND NIGHT LATCHES.

HP. NAIL CO.,
Wire Nails and Brads.

HOOSIER HANDLE CO.,
Pick, Axe, Sledge and Hammer Handles, &c.

POWELL TOOL CO.,
AXES, HATCHETS, EDGE TOOLS, &c.

L. COES & CO.,
Genuine Knife Handle and Mechanics' Screw Wrenches.

SPECIAL ATTENTION GIVEN TO THE EXPORT TRADE.

MECHANICAL.

New Return Flue Boiler and Superheater.

The Huber Mfg. Company, of Marion, Ohio, are building a new return flue boiler and superheater, which we illustrate in the annexed engravings. The shell of the boiler is a perfect cylinder and has a cylindrical flue passing through it to the smoke-box at the rear, forming the furnace and ash-pit. Smaller return flues parallel to the large flue return the products of combustion to the stack, thus bringing the flame and heated gases in contact with the heating surface twice in their passage to the smoke-stack. Surrounding the smoke-box of the boiler is a water-jacket which serves the double purpose of preventing too high a temperature at the end of the boiler as the return to the small flues is made, and to heat the feed water on its way to the boiler. From the sectional view of boiler it will be seen that the top of the main flue is lower than the smaller flues, so that in case of low water the plate directly over the fire is not bared of water first. This fact makes it impossible to bare the crown sheet of water readily when the boiler is on an incline. It will be observed that there is a cast pedestal in the middle of the furnace which parts the flames and forms an eddy, causing thorough mixture of the gases and promoting combustion.

The steam is super-heated before being admitted to the engine cylinder by being passed down through the furnace, through a double pipe, and back again. It is drawn from the top of the dome, passes down through the inner pipe that connects with top of dome, then back on outside of inner pipe between the inner and outer pipes to the cylinder. Both these pipes pass through the heated bridge wall, which heats the steam to a high degree; at the same time the pipes are perfectly protected from the flame.

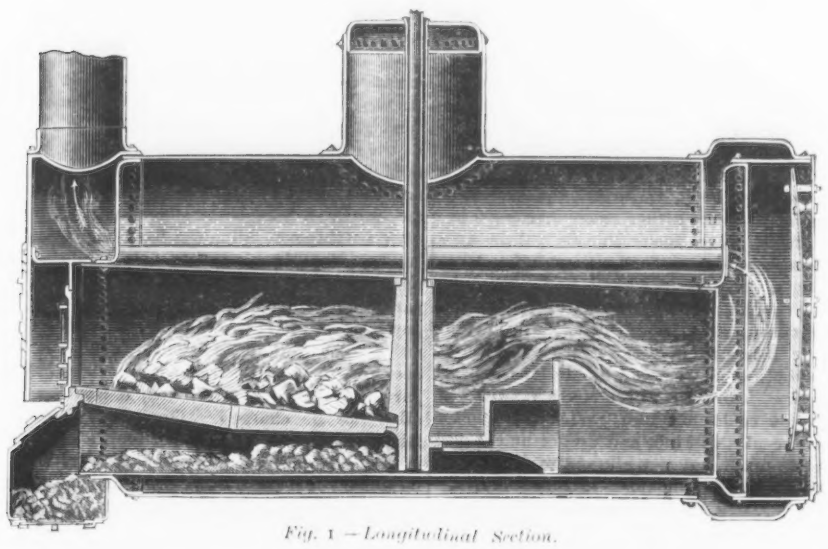


Fig. 1.—Longitudinal Section.

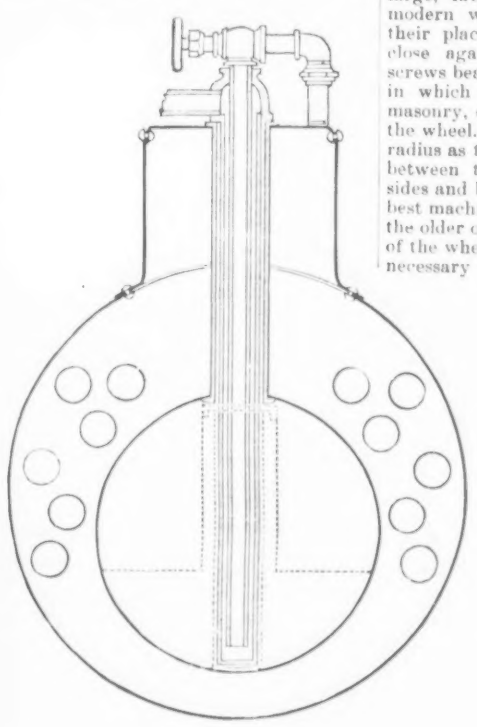


Fig. 2.—Cross Section, Showing Passage of Steam in Super-Heater.

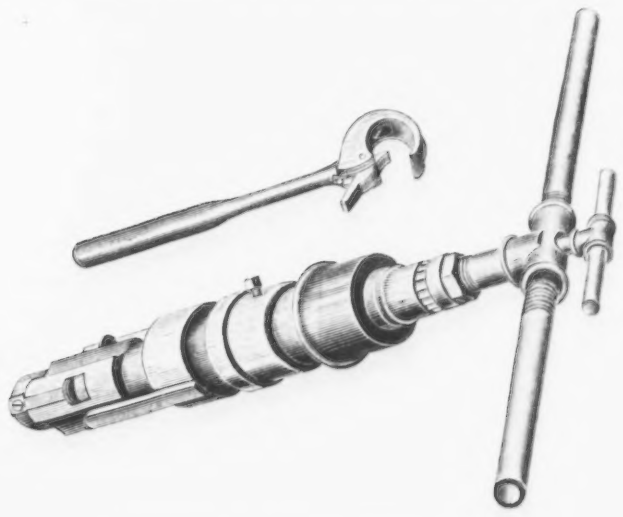
RETURN FLUE BOILER AND SUPER-HEATER, BUILT BY THE HUBER MFG. CO., MARION, OHIO.

Tight vs. Slack Car Couplers.

The main results of the tests made on the Chicago, Burlington and Quincy with trains of slack and tight couplers show that, though the use of tight couplings does not altogether abolish shocks, the bumps are far less severe than with the slack couplings. The results, according to the *Railroad Gazette*, are on the whole in favor of the close coupler, but show that with emergency stops shocks are not yet wholly abolished. A series of tests were made to further demonstrate whether as many cars could be started on a heavy grade with close couplers as with links. A train of 51 empty cars was made up, and out of this, with 15 feet of link slack, the engine succeeded in starting 46 cars. The slack was then blocked out by placing iron wedges between the draw-bars, and the same number of cars were started, apparently with less trouble, fully substantiating the results of former tests. Link slack apparently is of no advantage whatever over the spring compression in starting trains.

Baughman's Boiler Tube Cutter.

Messrs. Pedrick & Ayer, of the L. B. Flanders Machine Works, Philadelphia, Pa., are bringing out the handy little tool which we show in the annexed cut, and which is designed for cutting off old tubes for safe ending, inside the tube sheet, and for removal and cutting off the ends of tubes to proper length after they have been placed in the boiler and expanded at one end. This effects a great saving in time, and avoids the danger of splitting the tube, as often occurs when the chisel is used. It dispenses with all marking and taking out tubes after they have been put in the boiler and marked to cut to length, as is generally done with locomotive tubes. With this cutter it is only necessary to put them in once, expand in fire-box and cut to length. It makes no difference how uneven the tube sheet may be, the cutting is gauged from the tube sheet, and the ends will all be an equal distance from it. There is nothing about this cutter to wear out easily, or get out of order. The tool is made of steel and hardened. It has three revolving cutters that cut from the inside of the tube. While cutting, the bearing is all on these wheel cutters and none on the stock. It works easily and rapidly. The cutters are very inexpensive to replace; 300 2-inch tubes have been taken out in 10 hours at the Atlanta shops of Richmond and Danville Railroad Company. Different sizes are built for the various sizes of boiler tubes.



BAUGHMAN'S BOILER TUBE CUTTER.

Scoop Wheels for Drainage Purposes.

Mr. W. H. Wheeler, in his articles on the drainage of low lands by steam power, appearing in the London *Engineer*, speaks as follows of scoop wheels:

Scoop wheels have done exceedingly good service in the drainage of the land. When well constructed, and for situations where the hight to which the water has to be raised is not great, and where there is not much variation in the lift, they are effective and useful machines. The slow speed at which they travel fits them for being driven by windmills or the slow-speed beam engines by which these were succeeded. They are simple in construction, and easily repaired by the aid of such mechanical skill as is readily obtainable in country districts. They are not liable to get out of order when laid by, or easily damaged by floating substances brought to them in the water. To the mind of those living by the side of the rivers and drains of low flat countries, and accustomed to the slow practices of an agricultural life, there is a sense of power and solidity about a massive beam engine with its slowly revolving fly-wheel and heavy beam rising and falling, driving a ponderous water-wheel lifting a large mass of water, for which the small parts of a centrifugal pump and its rapid movements seem but a poor substitute. They are, however, exceedingly cumbrous, the wheel, weighing as much as one-fifth of the total body of water lifted at each revolution. The larger wheels, of, say, 30 feet in diameter, weigh from 30 to 40 tons, and therefore require very heavy foundations and expensive masonry work for the wheel race. The slow speed engines used for driving wheels are themselves as ponderous as the wheels, and also require heavy foundations and a large area of buildings. If engines of quick speed are used the loss of efficiency due to the gearing necessary to reduce the velocity of the engine to that of the wheel absorbs considerable power.

As generally constructed, scoop-wheels are very wasteful of power, and badly adapted to meet the alterations in the level of the water due to the falling of the level on the inside, as the water is pumped out of the drains, or on the outside due to the rise and fall of the tide, or of flood waters in non tidal streams. As the angle at which the scoops enter and leave the water seriously affects the working of the wheel, even in the best constructed machines, there must always be a loss due to variation in the level. The unnecessary hight to which some part of the water must be lifted also throws undue work on the engines, although it is not so regarded by all engine men. Professor Airey mentions a case of a wheel which he visited, the attendant on which took considerable pride in his wheel because it lifted the water well up into the air, regardless of the fact that the steam-power by which all this water was tossed in the air had to be paid for, and was so much waste of power. There is also loss from leakage of the water between the wheel and the sides and bottom of the masonry trough in which the wheel revolves. In the event of the surface of the land drained becoming lower—a frequent occurrence—it becomes necessary to deepen the drains and lift the water from a lower level, involving the lowering of the wheel or the lengthening the scoops, and reconstructing the masonry breast of the course, an expensive and difficult work, owing to the foundations being generally built upon piles. Most of the old scoop-wheels employed in the drainage of land are unnecessarily wasteful of power. Sir G. B. Airey, who examined one of these machines at work, was of opinion that four-tenths of the power applied was wasted, which might be saved by a proper arrangement of the parts. Many of the wheels do not give off a useful effect of more than 30 per cent. of the power applied. By improvements recently effected, more than double the quantity of water was raised, the consumption of coal being at the same time reduced 42 per cent.

The scoop-wheel in its simplest form consists of an axle, upon which are fastened disks, to which are attached radial arms, terminating at the other end in the rim, upon which are fastened arms with boards called "scoops." The wheel revolves in a trough, connected with the drain on the one side and the river or place of discharge on the other. The scoops beat or lift the water from the lower to the upper side, the waterway on the river or outlet side being provided with a self-acting door which closes when the wheel stops. On the inside of the rim are cast-iron cogs fastened on in segments, and geared into these is a pinion keyed on to the shaft of the fly-wheel of the engine, which gears into a pinion working on the crank-shaft. In some wheels a spur-wheel is fixed on the shaft of the wheel, in place of the toothed segments. The former plan occupies less space, but the wheel is more difficult to repair in case of damage to the teeth. In some wheels the framework, including the rim, is made in four castings, two forming one side of the wheel, and are bolted together and keyed to the axle.

The axle in the old wheels is carried on bearings resting on the masonry of the trough, and not provided with any means of adjustment except by packing. The gudgeons in the old wheels have no means of adjustment, and are generally unnecessarily large, increasing the friction. In more modern wheels the gudgeons are kept in their place either by a shoulder running close against the plummer blocks or by screws bearing against the ends. The trough in which the wheel revolves is made of masonry, carried up as high as the center of the wheel. The invert is made to the same radius as the wheel. The clearance or space between the wheel and the trough at the sides and bottom varies from $\frac{3}{16}$ inch in the best machines to $\frac{3}{4}$ inch, and even more, in the older ones. Owing to the large diameter of the wheels and their great weight, it is necessary that the foundation should be rigid and the wheel very nicely adjusted, as the slightest settlement causes the wheel to grind against the sides. Even with thorough adjustment there is always loss of water, owing to the space which must be left between the wheel and the masonry. In order to prevent this loss, some wheels have rims or shroudings on the sides, which partially or wholly inclose the water. If only partially shrouded, only a portion of the leakage is stopped, and, if wholly, a difficulty arises in providing for the escape of the air contained in the space between the two scoops, which consequently do not become fully charged.

The scoops are generally flat boards bolted to the start posts and dripping from the radial line at an angle varying from 20° to 40°. Owing to the variation in both the external and internal water levels, it is impossible to fix the scoops at such an angle as that they should always enter and leave the water in the way most favorable to the dis- charge. The larger the angle which the scoop forms with the surface of the water the better the scoop enters, and the better hold it gets on the water; and the larger the angle of egress the better the water leaves the scoops; consequently the more the angle of ingress is improved the worse becomes the delivery. If the angle of ingress be too small, too much of the scoop comes in contact with the water on first entering, and instead of drawing it gently forward, beats it back, causing a disturbing element detrimental to the discharge. If the angle of egress be too small the water does not drip off the scoop readily, but a portion is carried up with it above the level of the surface of the water, the hight to which the part of the extra water is lifted in some wheels due to this cause being as much as 6 feet to 8 feet, while the remainder is lifted from 2 feet to 3 feet. The undue work thrown on the engine from this cause may be realized when it is considered that the lift of these wheels seldom exceeds 10 feet, and is frequently only half this. The angle at which the scoop is placed should be regulated by the relative mean levels of the internal and external water.

The most common rule is to fix the scoops so that their angles of ingress and egress with the mean internal and external water levels should be equal. If there is any variation it is better to increase the angle of egress, as this prevents useless lifting of the water at the point of discharge, and more is gained on the egress than is lost on the ingress side. Some of the Dutch wheels, however, are constructed so that the angle of egress is double that of the angle of ingress. In order to avoid the undue lifting of the water, and also to facilitate the entry, wheels, both in this country and in Holland, have been fitted with curved scoops made of sheet iron, the rest of the wheel also being generally of iron. At normal levels these wheels work well, but when the internal water level alters, the convex part of the scoop strikes the water, and any advantage otherwise gained is lost. Wheels with curved floats should always be provided with a shuttle to adjust the flow of water. The variation in the level may, to a certain extent, be thus provided against. Curved wheels provided with a proper adjusting shuttle may be run with a greater speed than with flat scoops, as the water escapes off the scoops more readily, and will work effectively if run at a speed on the periphery of 9 feet per second. Curved wheels may also be made of less diameter than those having straight scoops. Wheels with curved ladles are in use at Zuidplas, Holland, for the Up-well and Out-well district in the river Ouse, and at Ravensfleet and Sturton on the Trent.

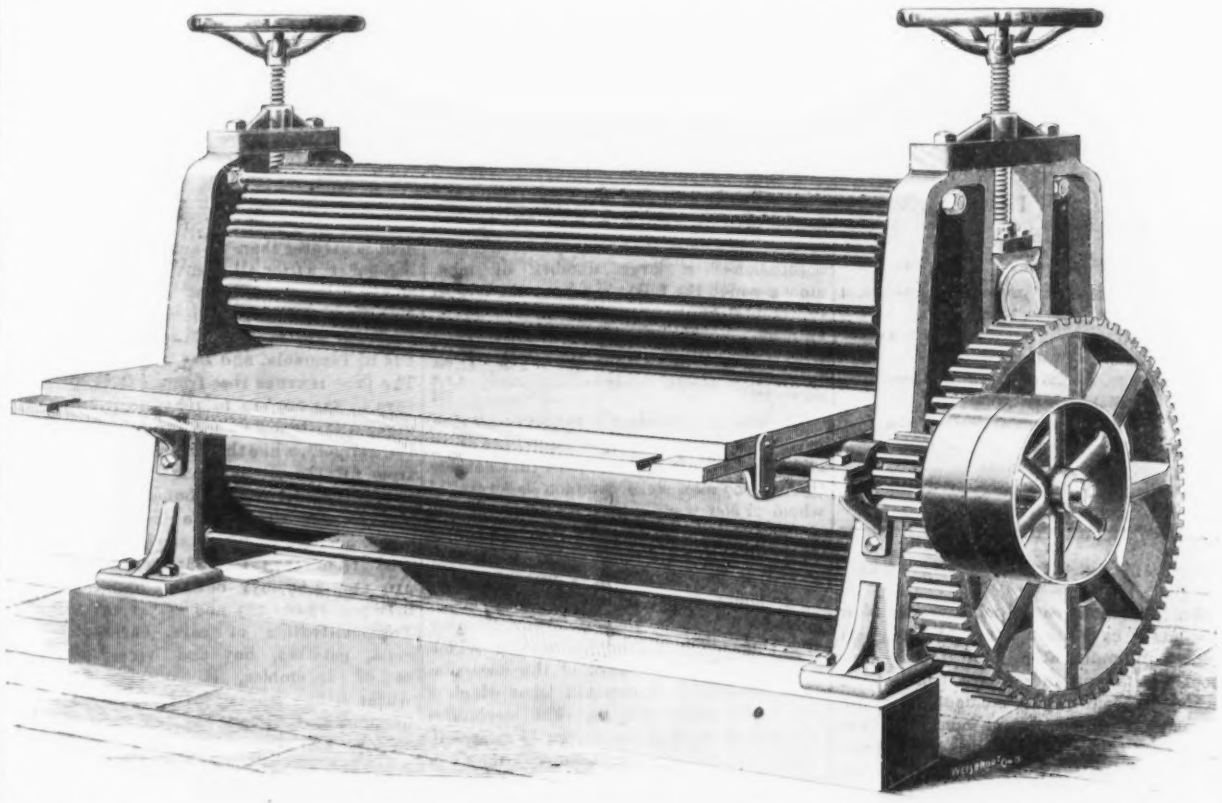
A New Railway Spring Testing Machine.

A new testing machine for trying springs of all dimensions has been designed and constructed for the workshops of the Southern Railway of France. As described in the excerpt minutes of the proceedings of the British Institution of Civil Engineers, it consists of a vertical steam cylinder, supported by four columns, by which it is connected to a block based on a wooden platform let into the ground. The ends of the springs to be tested are supported on two small four-wheel trucks, which run on a line of rails on the top of the block, whilst the buckle on the center is directly under the ram or piston-rod.

The cylinder is 24 inches in diameter and has a stroke or vertical range of 31 inches. The total maximum pressure exerted with steam of six atmospheres is about 17½ tons, applied to the middle of the spring. Steam is admitted above the piston through an orifice of very small section, and the pressure of the steam as the piston descends is always in equilibrium with the resistance of the spring. By means of an indicator in communication with the upper end of the cylinder, and by a suitable connection, a diagram may be taken showing the pressure of the steam at every point of the stroke, the abscisses being the measures of deflection, and the ordinates the measures of the load. The cost of the machine completed and erected was $840. In the course of the year 1885 it served to test ten thousand springs. It is capable, in case of need, of testing two hundred springs per day.

Double Corrugating Machine.

The large engraving on this page represents a double corrugating machine, built for the Globe Iron Roofing Company, of Cincinnati, Ohio, a short time since, by George C. Keene & Co., of the same place. We understand that the machine is patented, and that the special features embodied in this device are giving excellent satisfaction. Referring to the engraving, it is to be stated that one-half of the roll is made to corrugate to a small size, while the other side to a larger size. Referring to the special machine above mentioned, the small corrugations measure 1¼ inches and the larger 2½ inches. The rolls are 25 inches in diameter, and the corrugations are so arranged as to impart the forms to a sheet 30 inches wide. Of course, narrower sheets can be worked in case it is desired to do so. By the construction embodied the two sizes of corrugations that are in most common use are produced upon one machine without the necessity of changing rollers. The table is arranged to feed automatically, and is made in two sections. The lower section is attached to a bar which comes in contact with a pin, supported at its rear with a spring which forces a rod or bar, thereby moving forward the upper section of the table, to which are attached gauges, thus feeding the material to the machine. As represented in the engraving, the machine is adapted to be driven by power. It may also be run by hand in case it is desired to do so. When operated by power the rolls make continual revolutions. When run by hand, reverse motion can be imparted, so as to save turning the roll clear around. In length the machine is made to agree with the standard sizes of iron that are employed in corrugated work.



CORRUGATING MACHINE, BUILT FOR THE GLOBE IRON ROOFING CO., BY GEORGE C. KEENE & CO.

No Western town is happy without its "boom." Where natural gas fails to come to the surface after vigorous boring, other means of exciting interest in local affairs and institutions must be resorted to. In the case of Detroit, a New York firm have contracted with one of the newspapers there for a special edition to "comprise a carefully compiled and classified representation of the mercantile, manufacturing, professional and financial interests of Detroit and Michigan."

The Iron Age

AND METALLURGICAL REVIEW.

New York, Thursday, June 2, 1887.

DAVID WILLIAMS, - - - Publisher and Proprietor.
JAMES C. BAYLES and
CHAS. KIRCHHOFF, Jr., - Editors.
GEO. W. COPE, - - - Associate Editor, Chicago.
JOHN S. KING, - - - Business Manager.

RATES OF SUBSCRIPTION

INCLUDING POSTAGE.

THE UNITED STATES AND BRITISH AMERICA.

Weekly Edition ..... **$4.50 a year**
Issued every THURSDAY morning.

Semi-Monthly Edition ..... **$2.30 a year.**
FIRST and THIRD THURSDAYS of every month.

Monthly Edition..... **$1.15 a year.**
Issued the FIRST THURSDAY of every month.

ALL OTHER COUNTRIES,

PER ANNUM, POSTPAID,

Weekly Edition: $5.00=£1=25 francs=20 marks =12 florins=6 roubles (coin)=25 lire=20 pesetas.

Semi-Monthly Edition: $2.50=10/=12½ francs =10 marks=6 florins=3 roubles (coin)=12½ lire= 10 pesetas.

Monthly Edition: $1.25=5/=6¼ francs=5 marks =3 florins=1½ roubles (coin)=6¼ lire=5 pesetas.

REMITTANCES

Should be made by draft, payable to the order of David Williams on any banking house in the United States or Europe; or, when a draft cannot be obtained, in postage stamps of any country.

NEWSDEALERS OR BOOKSELLERS

in any part of the world may obtain THE IRON AGE through The American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company San Francisco, Cal., U. S. A

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

One Insertion.....	$2.50	One Month.....	$7.50
Three Months.....	15.00	Six Months.....	25.00
One Year.....	40.00		

PAYABLE IN ADVANCE.

BRITISH AGENCY:

Office of *The Ironmonger*, 42 Cannon St., London

DAVID WILLIAMS,

PUBLISHER,

66 and 68 Duane Street, New York.

PHILADELPHIA ... .220 South Fourth Street
THOS. HOBSON, Manager.

PITTSBURGH..... .....77 Fourth Avenue
ROBERT A. WALKER, Manager.

CHICAGO..... .....36 and 38 Clark St., cor. Lake
J. K. HANES, Business Manager.
GEO. W. COPE, Resident Associate Editor.

CINCINNATI.....Corner Fourth and Main Streets
HENRY SMITH, Manager.

CHATTANOOGA.. .....Ninth and Carter Streets
S. B. LOWE, Manager.

The Character of Our Immigration.

Even the most casual observer in New York must have been struck by the great increase in immigration indicated by the troops of Italians and others which have become an almost daily incident of metropolitan street life. Their numbers have grown very rapidly during the current year, April alone, according to official statistics, being credited with the arrival of 73,107 men, women and children, while in the first four months of 1887 the number of immigrants was 137,406 against 90,089 in 1886. The movement is one which a good many earnest citizens view with some alarm, and the feeling is growing that unchecked immigration is by no means an unmixed blessing. In nearly every case the violence and lawlessness during the period of unrest which is still prevalent are directly traceable to that foreign element in our population which has not been assimilated. Let it be conceded that the un-American anarchist and socialist element is not nearly so numerous as its boisterous manifestations might lead a superficial observer to believe, still the fact remains that no mean accessions are coming to them every year from abroad, and that they have some influence upon a large part of our population, which, though born in this country, is still largely under the influence of foreign traditions. We do not believe that these elements are the source of any lasting danger, but they have already been and are likely to be very troublesome indeed. Such considerations have weight with many thinking men, and may be skillfully used from other motives by those who are eager to restrict immigration. It is difficult to see how additional safeguards can be devised to keep out paupers or men bound under contract. Our laws cover the ground quite well, but it is evident from the cases which crop up from time to time that they are not so stringently carried out as they should be. The danger of precipitating further restrictive legislation would be that it probably would do much injury by keeping from our shores the most desirable immigrants for the sake of holding back the dangerous elements.

In dealing with the question, some consideration should be given to the nationality and the occupations of the immigrants, concerning which the returns of the Bureau of Statistics furnish much material. During the year ending June, 1886, the total number of immigrants was 334,203, of whom 66,188 were under 15 years of age, while 232,118, or 145,340 males and 86,778 females, were between the ages of 15 and 40: only 35,897—that is, 21,184 males and 14,713 females were 40 years old and upward. Out of the 334,203 immigrants, not less than 328,528 came from Europe, and it is with them which we must principally deal. Leaving aside the children and those over 40, the immigrants were classified as follows, according to the countries of their last permanent residence or citizenship:

	—Fifteen to forty—	
	Males.	Females.
England	22,215	11,569
Ireland	19,321	20,048
Scotland	5,454	2,714
Wales	457	237
Austria	5,858	2,430
Bohemia	1,398	1,191
Hungary	7,445	2,038
Denmark	2,969	1,563
France	1,630	772
Germany	30,617	22,569
Italy	10,991	3,841
Norway	5,810	2,845
Russia	7,714	3,414
Poland	2,810	664
Sweden	13,642	7,571
Switzerland	2,127	1,180

Great Britain, it will be observed, contributes the largest number of immigrants, the great majority of whom may be considered a very desirable class. The same is true of the Swedes, Norwegians and Danes, and in a lesser degree of the Germans, Swiss, Dutch, and some Austrians. The Hungarians, Poles and Italians, generally speaking, are not an element which is welcomed. So far as the occupation of immigrants is concerned, the Bureau of Statistics furnishes detailed data. In the following table we have collected these occupations, of which more than 500 representatives have arrived on our shores:

Occupation of Immigrants.

	Males.
Professional	1,943
Bakers	1,209
Blacksmiths	1,420
Butchers	1,190
Carpenters and joiners	3,678
Clerks	3,927
Engineers, N. E. S	798
Gardeners	522
Mariners	1,802
Masons	1,835
Mechanics, N. E. S	1,886
Miners	3,469
Painters	774
Shoemakers	1,681
Tailors	2,680
Tobacco dealers and manufacturers	1,149
Weavers	838

The total of what is classed as skilled occupations aggregates 31: 159 males between 15 and 40 years and 4108 above that age, and 1229 females. This represents less than one-fourth of the total number of immigrants in their full manhood. The Bureau of Statistics classifies under "miscellaneous occupations" a large number of men, among which the following have the largest representation:

Farmers	20,528
Laborers	86,807
Merchants and dealers	5,729
Peddlers	1,125
Servants	761

The total of this class is 117,546 males, of whom 101,967 were between the ages of 15 and 40 years. It will be noted that not less than 86,807 men were common laborers, of whom 76,860 were under 40 years of age, or more than half of the whole number of men who arrived in this country, while only 20,528, or less than 1 in 7, were farmers. This should dispel many erroneous ideas, only too prevalent, that it is our farming and not our industrial occupation which receive the greater share of the accession from abroad. It is common labor which is principally attracted to us. The mechanics and skilled artisans, whose pay is relatively much higher in this country than in the countries from which our immigrants principally come, have therefore least to fear from the competition of foreigners. It is the common labor, which, compared to other methods of livelihood, is least tempting here, that sees annually the greatest accessions to its ranks. We believe that herein lies one of the most potent reasons for the deep discontent which prevails among those who have no other occupation to depend upon than common labor. The foreigners who come within this group generally, too, have not enough intelligence to rise. Very few of them acquire property by industry and frugality, or assimilate readily with our own people. It is this class, and particularly the Hungarians, Poles and Italians, who constitute a heavy percentage of the whole, whose invasion of our country in large numbers is the leading drawback of the great immigration now going on.

The Interstate Commerce law has now been in operation long enough to enable some of its effects to be seen in certain localities. Without taking a general view of the subject we may mention that the testimony of the manufacturers along the Upper Mississippi is strongly in favor of the law as far as it has been construed by the railroad companies operating in that territory. The river interests are reviving everywhere. Lines of steamboats are being started, old warehouses are coming in demand, river towns are furbishing up, and a spirit of unusual activity pervades the whole section. As typical of the feeling existing there we may cite the experience of a prominent manufacturer, residing in a city in Iowa along the Mississippi River. He said that at first, after the new law went into effect, his business ceased almost entirely. No new orders came in, old orders were rapidly filled, prospects were blue, and the bottom seemed to have fallen out of his trade. For three weeks he was of the impression that he had been left high and dry by the shifting of the currents of trade under the new law regulating transportation. But gradually at first, and rapidly afterward, the orders came rolling in, until now his works are being pushed to their full capacity, and he realizes that the hesitation in trade which he experienced was simply due to the fact that buyers almost invariably made up their minds to wait to see what effect the act would have. As it has not caused widespread bankruptcy they have taken heart and are going ahead placing their orders and transacting their business, only missing the rebates that they formerly received regularly from the railroads to which they furnished sufficient traffic to secure such an arrangement.

Australian Progress.

The colonial conference in London, its debates, and the coming centennial celebration of Australia's colonization in 1788, in the shape of an international exhibition at Melbourne, invest everything relating to those progressive colonies with special interest. We shall therefore avail ourselves of the recently published report of the Government statist at Victoria for 1885, in order to show the extraordinary material development that has taken place in that part of the world, notwithstanding the great distance that separates it from the populous West of Europe, so discouraging to emigration. Six of the seven colonies have their own administration; the seventh, West Australia, is Crown land and is governed from England. The total area is 2,551,786 square miles, only some 400,000 square miles less than the United States and Territories. At the close of 1885 Australasia had a population of 3,334,325, having risen to that figure from 2,640,603 on Dec. 31, 1878, and from 1,753,000 in 1867. While the total increase during the seven years from 1878 to 1885 was 26 per cent., it was distributed as follows: Victoria, 13 per cent.; New South Wales, 38; Queensland, 55; South Australia, 26; West Australia, 25; Tasmania, 22; and New Zealand, 22.

The public indebtedness of the seven colonies was in the aggregate £42,672,423 in 1873; in 1885, it was £140,970,119. The bulk of the money spent being for public works, such as railroads, Government buildings, &c., of permanent utility. The magnitude of indebtedness causes no uneasiness at home or abroad, as the people are well able to bear the burden, and in the case of railroads the capital invested earns good interest. Per capita of the population, the debt is greater than in any other country, being £41. 4/ for all Australasia, and for the single colonies: £29 in Victoria; £32 in New South Wales; £61 in Queensland; £53 in South Australia; £38 in West Australia; £25 in Tasmania, and £63 in New Zealand. The joint revenue rose from £12,262,007 in 1873 to £24,017,112 in 1885, toward which taxes contributed £5,394,936 and £9,358,545 respectively, while the expenditure increased from £10,171,347 to £25,221,578. Taxation is comparatively heavy, but wages are high, and the necessaries of life cheap.

The acreage of wheat seeded has fluctuated from 1873 to 1885 between 1,513,419 and 3,697,954 bushels, and the yield between 17,061,283 and 45,541,592 bushels. The cultivation of oats, barley, indian corn, potatoes, hay and vines, as well as of vegetables, is considerable, but wheat is the leading product. Vines have fluctuated between 14,128 acres and 19,395, and the wine secured between 1,438,000 and 2,392,132 gallons. The aggregate of tilled land ranged between 3,306,923 acres, and 8,014,329 as extremes. Live stock ranged during the 13 years between the following extremes: Horses, 750,404 to 1,230,138; cattle, 5,349,512 to 8,225,779; sheep, 45,439,322 to 83,369,372; hogs, 549,808 to 1,019,744. The frequent, often disastrous, droughts are the cause of these fluctuations.

During the last 50 years the import into Australasia increased from £1,500,000 to £63,500,000, and the export from £1,300,000 to £52,000,000. In 1873 the former was £42,218,024; in 1885 it reached £63,268,491, the latter rising from £42,017,799 to £51,553,486 in the meantime. There entered and cleared 14,540 vessels, with an aggregate tonnage of 5,099,150 in 1873; in 1885 they numbered 16,892, of a joint capacity of 12,407,999 tons. There were in operation at the close of 1885 7990 miles of railroad, against 1495 miles in 1873, 2253 miles being under construction and 7910 projected at the close of that year. The 7990 miles had been built at an expenditure of £78,774,368, the gross earnings amounting in 1885 to £6,893,193 and the expenses to £4,416,661. Telegraphs measured in length 35,531, against 8,784 in 1873, the length of wire being 66,439 miles; there were 1812 offices, and the income in 1885 was £575,149. The postal service was carried on through 5016 post offices. The income of the department was £1,049,212 and the outlay £1,502,535. The report is silent on the progress which Australia has made in the development of its mineral resources, on which some additional pamphlet will probably be published, in view of next year's exhibition.

With regard to the Colonial Conference in London, it appears that the idea of federation is abandoned, the interests of the various colonies being too far apart, nor is the idea of a customs union entertained. The latter would signify a system of protection against the products of foreign countries for which neither England nor several of the most important colonies are prepared. That the political bonds should be drawn tighter all agree, particularly as regards the common defense. Fourteen practical questions are to be solved: 1, the defense of Australian ports; 2, that of Torres Straits and Simon's Bay by all the Australian colonies; 3, that of Table Bay, Cape of Good Hope; 4, the establishment and defense of coaling stations; 5, cable communication between the mother country and the colonies; 6, the subsidizing of those cables now laid; 7, the building of ports and cruisers in and for the Pacific; 8, increase of the colonial squadron; 9, facilitating army and navy officers entering the colonial service; 10, foreign relations with reference to colonial possessions; 11, the postal service and tariff between England and her colonies; 12, salvage at sea; 13, execution of colonial judicial decisions in England; 14, condition of native States in South Africa. To this programme may be added that of a general census on a given day throughout the empire. There has been some rather angry discussion between the Government officials and the Australian representatives about the compromise between England and France on the subject of occupation of the New Hebrides, Australians being afraid that their interests may suffer from England's position as a great power and the considerations it involves. England's answer was that it could not well go to war about a matter of this kind, and we presume it will be dropped and not allowed to disturb the otherwise existing good harmony between the mother country and the distant dependencies.

The Position of Non-Union Men.

A recent occurrence in a Western city illustrates the difficulties which beset the path of American workingmen. An establishment employing a considerable number of operatives was compelled by the lack of demand for its special product to suspend operations for an indefinite time. The workmen were informed that it would probably be a long time before the works were started, and in the meantime it would be well for them to seek employment elsewhere. As their trade was one requiring considerable skill and experience, and similar establishments in many other parts of the country were still running, it might be supposed that a considerable number of them could secure employment. Perhaps they could have done so under some circumstances, but they found one very great obstacle in their way—namely, they were non-union workmen, while the establishments in operation were controlled by a trade union of the most aggressive and uncompromising character. Moreover, the unfortunate workmen to whom we allude had but a few months before accepted employment as non-union men after a long struggle between their employers and the union, which had embittered the latter not only against these works, but against the men who dared to enter their service.

In fighting the union this particular establishment secured a position of independence which was regarded as eminently desirable for many reasons, and numerous other concerns employing large numbers of workmen possibly wished themselves equally free from the domination of mill committees and district delegates. The victorious employers doubtless gave little heed to the future of the men who were willing to renounce the union for present employment. The possibility of a stoppage of work and the consequences to non-union workingmen were perhaps very little, if at all, thought of. The immediate aim of the one party to the controversy was control of wages, working hours and manufacturing operations, while the absorbing desire of the other party was to secure work, even if ties to other men in the same line of mechanical occupation had to be severed.

Now the end has come, the works are stopped and the force of employees is scattered to seek in every direction for the means to buy food and clothes and shelter for their dependent families. Of course it would be too much to expect employers to expend large sums of money unprofitably, merely to give their workpeople an opportunity to earn enough to keep themselves and their families from want. But in this particular case by the stoppage of their works the employers have done more than withdraw immediate employment from their men, inasmuch as they have put it out of the power of their workmen to apply to union establishments, which are almost exclusively the only ones at work in this line of trade.

It is argued that this fact imposes upon non-union employers a greater responsibility, since it puts the men into a comparatively helpless position—dependent upon the prosperity of the one concern for which they are working. While this is true, and while it may in individual cases, like the one cited, be the cause of much hardship, it should not be forgotten that the non union workmen enjoy advantages not to be underrated. They are free from the payment of dues and assessments, are not fettered by laws which put the good workman on a par with his inferiors in skill and industry. They are not liable to be forced into idleness without a moment's notice because a fellow-craftsman, thousands of miles away, has, or believes he has, a grievance. To hold aloof from a trades union means no mean order of self-reliance on the part of a workman, and a corps of such men are likely in the long run to prove a great advantage to any manufacturer, and through aiding to his success minimize the danger of occurrences like that alluded to.

Employers of non-union labor should fully recognize the risk their men are taking. It is a phase of the trades union question which specially appeals for settlement on humanitarian grounds. As business men they will find it good policy to do all within their power to make the risk as small as possible.

Cost of Transportation.

Although throughout the railroad world the principle of basing rates of freight directly upon cost of service has been generally abandoned, yet under our modern methods the time is fast coming when more attention must be given to this branch of the problem. As the fixed expenses of a railroad may be as high as two-thirds of its total outgo, any rate of freight which pays its proportion of the one-third variable expense and contributes anything at all to the fixed charges is in so far profitable. The first condition, then, of good railroading demands that the particular traffic under consideration must pay the cost of service, and by cost of service we mean that additional expense incurred by the railroad in transporting that particular property with which it would not otherwise be charged. Obviously if the freight charges are below this limit a wrong is done either to the stockholders or to the other patrons of the road, who must make up by freights upon their shipments the loss upon the favored traffic. We have seen that the average of this variable expense is one third of the whole; but this is an average, while some articles may cost more than that proportion and others less. The first step on the road toward a perfect understanding of his business is a calculation by the merchant of his average expense; the next is a more thorough study of statistics by which the proportion of expense of each particular department or article is shown. It is only by the latter that the true workings of the business can be shown. What, then, in transportation is this cost of service? With our present knowledge it is almost impossible to determine it. We believe that railroads are the only large corporations who have made but little effort toward collecting accurate statistics of their separate kinds of business. Under the system of Captain Metcalfe and others like it, our large factories are able to trace the cost of any kind of manufactured product through the entire works. There is no guesswork; what price can be obtained, and what the cost; in what this cost consists and what saving can be made in the process of manufacture, are all before the minds of the managers of our locomotive and other works, who are thus enabled to judge accurately and quickly of the questions of price and profit.

It is true that the traffic of a railroad system is much more complex than that of even the largest manufactory, but it is certainly possible for us to have better knowledge of the actual cost of transporting our important commodities than we now possess. Mr. Chanute has shown us some interesting differences in the cost of handling goods according to their shape, of station expenses, &c., but to be of benefit these experiments should not be spasmodic, but should extend over a series of years, be conducted by the railroads themselves and carefully carried out. Until this is done the important matter of cost of service and its limitations upon freight rates must always be uncertain. It will be a good thing if the Interstate law shall indirectly call public attention to this important and too-long-neglected matter of statistics of cost of transportation. Partly under State compulsion we have now public reports of railroad balance sheets, with statements of the average receipts and expenses per ton per mile; what we now need is such reasonably accurate figures of the profits of special articles as will show what traffic is worth developing, what rates can be reduced with hopes of larger tonnage, and whether any lines of traffic, perhaps favorites with managers, may not be stimulated at an actual loss. Could we have these figures regarding railroad business as we now have them in other corporations, it is easy to see that such statistics might work a revolution in some accepted theories of transportation. Is it not the duty of our railways to take steps toward this desirable end? Let us take a practical example. The trunk lines have a number of piers, freight depots, elevators, &c., in the city of New York, at which they receive and deliver freight consigned to or from different parts of the country. The total expenses of each station are accurately known, including cost for labor, for clerks and for lighterage. The quantity of merchandise handled is also known, together with the number of cars loaded and unloaded. Thus the average expense per 100 pounds or per car is easily calculated. But this is only an average, and includes the high cost of handling light boxes, the low cost of tierces, and other great differences. Let these railroad companies at their stations begin a series of experiments to show what proportion of this expense is caused by the receiving and delivering of our more important staples. In like manner let the cost of handling pig iron, blooms, coal, grain and other articles be inquired into. Let these in-

quiries be extended to the train service, so that finally what proportion of expenses of the whole road may be chargeable to each line of traffic may be at least approximately ascertained.

A moment's consideration should here be given to a fallacy which has not yet died out of the railroad mind, and which in years gone by gave rise to much of the unjust discrimination which ended in the Interstate law. Given, a railroad running from A to B. The managers are agreed that a fair rate on nails from one point to the other is 20 cents per hundred. New nail works are built at C, which must compete at A with the old established works of B. The railroad manager wishes to encourage the new enterprise at C and gives them a rate of 5 cents less than the B rate, supposing circumstances to be substantially the same. When reproached by B for the evident discrimination in favor of C, the manager replies, "Your works are established and 20 cents is fair. With your business added I can afford to take C's nails for 15 cents, because with our volume of business it does not cost us that much for additional service." The obvious wrong in this is, of course, that B's nails are loaded with their share of all the expenses of the road, while C's nails, by coming in afterward, escape. It needs no argument to show that every shipment of the same kind of article should bear the same proportion of all charges for transportation in any calculation of freight rates. In the interest, then, of all our important industries, let a beginning be made toward putting the theory of freight rates upon the firm foundation of relation to cost of transportation.

The Soft Steel Trade.

The manufacturers of soft steel are finding their pathway strewn with anything but roses these days. Slabs, blooms, billets and rods have been and are still being imported in large quantities under the 45 per cent. ad valorem arrangement of the present tariff. It is alleged that it affords opportunities for undervaluations too tempting to resist, and a number of cases have undoubtedly occurred. The consequence is that, with low first cost in Great Britain or Germany and low duties, when compared with the high specific duties levied on other forms of iron and steel, domestic manufacturers of soft steel find themselves with a gradually contracting market. On one form of soft steel, however, the duty is as prohibitory as could be desired—namely, on nails. But unfortunately the nail manufacturers have thrown away their opportunities in this direction, and, although the consumption of nails in this country is enormous, the capacity for production considerably exceeds it. There should be ample remuneration for our soft steel manufacturers in the nail trade, and they would then be relieved from the disagreeable necessity of competing desperately for business in branches open to foreign competition. Whether they can ever get the nail trade into this desirable condition is a question, but it is certainly so important, so significant, and, in fact, so vital a subject, that it is worthy of much more careful and earnest consideration than seems to be given to it. Those engaged in the trade may insist that they are giving their most earnest attention to its management, but the results are certainly of a kind not to be boasted about.

The deplorable condition of affairs in this branch of trade is particularly noticeable about Wheeling, which has become a prominent center of the soft steel industry. The pioneers in the trade there met with a success that induced competition, but for a time satisfactory results were obtained, until the bottom dropped out of the nail trade and foreign soft steel products fell to their present abnormally low price. Recent advices from that locality state that the mills of the Ohio valley look desolate. The nail factories are all idle, and the steel works are doing practicslly nothing. Occasionally, a few orders are received for soft billets, and the works run for a few days, then shut down again.

In the meantime foreign makers are supplying American consumers in quantities that, if given to our idle works, would keep the majority of them busy. The duty on steel billets reduced to a specific equivalent is said to be between $6.75 and $7 per ton. At times, therefore, it may practically be the same duty as that on pig iron, but, considering the waste in converting pig iron into steel, this duty is really less than on pig iron.

The result is that soft steel can penetrate further inland than the pig iron from which it is made, although for a number of reasons the American material is given preference by buyers. The rise during the last months of 1886 and the first of 1887 gave foreign makers their opportunity, of which they promptly availed themselves. When the drop in nails took place the Wheeling mills notably at once turned their attention to billets, and have succeeded in completely recapturing the markets west of the Allegheny Mountains, no foreign billets or slabs having been sold for that quarter for the last two months.

It is only too evident that the first duty of the soft steel makers should be to do all in their power to open new channels for their raw material, since there are so many nail mills equipped with an excess of steel capacity and new plants are still going up. One of them, it is understood, has led the way in this direction by building a tube mill. The question is worth looking into, whether or not it would be practicable to compete against foreign wire rods, of which a growing quantity is shipped west of the Alleghenies, in spite of the increase of the make in the United States during the last few years.

Iron and Manganese Ores in North Carolina and Georgia.

BY JOHN BIRKINBINE.

A trip to the section of country near the point where the boundary lines of North Carolina, Georgia and Tennessee meet is replete with features of interest from sentimental as well as from practical standpoints, for the picturesque mountain scenery is supplemented by varied mineral resources, and legends of the Cherokee Indian occupation or antecedent Spanish explorations for precious metals are abundant. The prominence given to Asheville by its advertisement as a resort will make unnecessary any reference to the mountain scenery encountered in reaching this city, which claims an elevation of 2250 feet above the ocean level, and peaks in the neighborhood reaching to a height of 6700 feet: nor will any attempt be made to describe the railroad developement in ascending the steep Eastern face of the mountains on which a train "goes by a point three times before it is passed." In approaching the southwestern corner of North Carolina via Asheville, the mountains' scenery continues, and it increases in wildness as the fastnesses are penetrated. A branch of the Western North Carolina Railroad is constructed just 100 miles from Asheville, southwest to Jarrett's, a small settlement on the Nantahali River, to reach which the road passes by steep grades over the Bolsom Gap at an elevation of 3411 feet above the ocean, which is claimed as the highest point reached by railroad, except at Mount Washington, east of the Rocky Mountains. After skirting the Little Tennessee the road crosses it on a trestlework and passes one of its branches—the Nantahali—a stream which has cut its way between frowning mountains, and which is a succession of falls and rapids. Beyond Jarrett's the road is located to Murphy, the county seat of Cherokee County, North Carolina, and construction work is now in progress as far as Red Marble Gap, which the road is expected to tunnel at an elevation of 2680 feet. As the labor is performed by State convicts, of whom 150 are allotted to the rairoad company, it is not expected that the connection will speedily be completed to Murphy, for it is hardly probable that the company will increase their employees by hiring additional labor unless forced to do so, and the number of convicts allotted is far too small to build 30 miles of railroad within any moderate time limit. The chances of connecting from the South are much better, but there will for the present be a narrow-gauge railroad which will be completed from Marietta, Georgia, to Murphy this year. The sills, however, are being laid for standard gauge, and it is the intention of the Marietta and North Georgia Railroad Company to widen the gauge as soon as possible.

Entering the district via the extension of the Western North Carolina Railway from its terminus at Jarrett's, in Swain County, N. C., a general southwest course was taken after passing the Red Marble Gap from the drainage of the Nantahali River to that of the Valley River. The basin of the Valley River was traversed from its source to its confluence with the Hiwassee River at Murphy, 25 miles, and some of its tributaries were also followed. Several of the branches of the Hiwassee River and part of its main valley above Murphy were also visited, as well as the drainage area of the Nottla River, which enters it below Murphy. The trip ended with a visit to some of the branches of the Ocoee or Toccoa River in Georgia; near the present terminus of the M. and N. G. Railroad, and thence to the picturesque city of Marietta, lying under the shadow of the Keneesaw Mountain. The extremes of the territory examined, viz., between Jarrett's, N. C., and Mineral Point, Ga., are about 50 miles apart, but fully thrice that distance was covered by wagon or foot travel in the two weeks spent in the region. The territory is in the mountainous section of the States named, and although the localities specially visited were all in the valleys or minor hills, their elevation was from 1600 to 2700 feet above tide, the adjacent mountains being of much greater altitudes, and some of them are of most imposing proportions and picturesque outline. The district seems well provided with mineral, and 40 years ago was the scene of a gold mining excitement, considerable gold being obtained by washing; the extent of these operations are visible by numerous openings. Although but little gold is now panned in the region, the territory is generally credited with being rich in this mineral; but to obtain it modern methods must be employed.

Prior to the California gold fever the section of the States of North Carolina and Georgia described, attracted numerous prospectors, and the expectations of future wealth have not yet died out among the inhabitants. The general intelligence and universal courtesy of the "habitant" is probably owing to the fact that their ancestors entered the region either to seek for gold or to take up lands vacated by the Cherokee Indians, the distances to be traversed and the difficulties to be overcome having encouraged only men and women of sterling character or determination to locate there. But while inheriting these good qualities, the present population hold too closely to some of the older customs for which no necessity exists, prominent among which is the careless construction and maintenance of their dwellings. When a family located temporarily to work out a gold claim or permanently to develop or cultivate land which had grown into cane breaks under the Indian regime of laziness, a rude log hut with the chinks open was excusable, but the progressive sentiment of the day is shocked to find whole families of grown-up children living with their parents in a rough cabin of two rooms, from any part of which the outer world can be seen through the chinks, unless temporarily protected by newspapers. If we find ignorance, poverty and vice in such tenements there is no surprise, but to hear good English correctly spoken, and to be treated with refined politeness and courtesy makes the contrast of surroundings more marked, and one longs for a New England epidemic of whitewash and green paint to attack the community. The district is not without its comfortable homes, but the majority of the people dwell in log houses, where in winter a constant contest is maintained between the blazing logs in the open fireplaces and the chilly wind whistling through openings in the walls, which a few hours' labor and a wagon load of clay would make tight. But in this particular the district is not unlike many other Southern sections. The effect, however, is probably more pronounced when considered in connection with the character and condition of the people of this mountain country, who have been until the present cut off from rapid communication with the outer world.

A number of old shafts and tunnels are claimed to have been of Spanish origin, there being no record of who sunk them. Tradition says they were sunk by De Soto's men, but whoever is responsible for these explorations carried them on at great cost, for deep shafts and long adits have been partially explored, and it is claimed that no tool marks are discernible. The existance of charcoal in the workings encourages the belief that the rocks here were in part broken by the ancient method of fire and water. Silver has been obtained to a limited extent as argentiferous galena from shafts, and many excavations for copper have been made. The prominent copper deposit is to the east at the juncture of the boundary lines of North Carolina, Georgia and Tennessee, near Ducktown, where extensive works were built and mines opened. In addition to the iron and manganese ores hereafter referred to, nickel ore, talc and marble are among the minerals which appear, and considerable corundum is also mined and shipped. The district having passed through the gold and copper excitements, is now considering its iron and manganese ores as well as the development of marble and talc deposits which offer favorable indications, to facilitate which numerous pits and ditches have been excavated. Unfortunately the visit was made at a time to see the properties to the least advantage, for in some cases where explorations had been made they had not progressed sufficiently to give a correct idea as to the extent or character of the ores, while in others test pits or excavations which had been made in the fall had filled with earth thrown in during the winter by frost, or with water, the latter caused by the fact that all the streams were full at the time.

IRON ORES.

North Carolina has a greater abundance and variety of iron ores than is ordinarily credited to it, and their distribution throughout different parts of the State would encourage the belief that they would sustain a considerable smelting industry; such, however, has not heretofore been the case, for while iron has been produced to a limited extent, the quantity has never been sufficiently great to give the State a prominent position as an iron producer. As a known producer of iron ore North Carolina outranks in age any of her sister States, for the first iron ore sent from this country came from North Carolina. A few blast furnaces of moderate capacity have been operated in the central part of the State and a number of Catalan forges have until lately maintained a precarious existence principally along its western boundary. These industries used charcoal to produce metal from brown hematite and magnetic ores, and lately a plant to smelt the rich magnetites of Mitchell County has been put in operation. Throughout the entire district examined and upon almost every farm there are numerous evidences of iron and manganese deposits, sometimes as iron ore, at others as manganese ore, and probably more generally as manganiferous iron ores. Lying convenient to these ores a carbonate of lime, generally as marble will supply flux cheaply, and the abundance of timber will, if proper methods are employed, produce charcoal as fuel for smelting. That these ores are well distributed over the territory examined is evident, but the extent of individual deposits can only be determined by actual exploitation and the quality known by analyses. The physical characteristics of the ore seem to indicate chiefly the presence of brown hematites, which are the most abundant and are more or less intimately associated with the manganese ores, in some cases a brown hemetite lying close to a manganese ore. There are several points where particles of sand adhere to the magnet and where ore showing decidedly magnetic properties evidently occur, but in only one instance has an excavation developed any of this class of ore, and it was really a mixture of magnetic and peroxides of iron. Several excavations indicate that red hematite ores may possibly be mined, but it is probable that the oxide is chiefly hydrated, the red hematite being mixed with the brown ore. The ores seem to lie between well defined strata and approximate veins or seams more than the pockets, which are common in brown hematite deposits; but exploitation may show these apparent seams to be benches of solid ore in clay carrying sufficient lump and fine ore to pay for separation by washing. The iron ores analyzed show the following composition:

Samples.	Iron.	Phos.	Mang.	Silica.	Phos. in 100 iron
"D"	64.89	0.092	....	1.29	0.143
"E"	47.83	0.389	....	..	0.813
"K"	52.79	0.616	..	....	1.166
"KK & KP"	54.17	0.798	10.44	....	1.475
"O"	40.34	0.53	....	....	1.313
"P Y & R"	40.70	1.089	....	....	2.675
"S"	36.01	0.069	....	....	0.191
"WA"	41.32	0.502	....	....	1.213
"GR" *	54.625	0.302	0.351	....	0.548

* "GR" is from Fanain County, Ga.; all the others are from Cherokee County, N. C., but "WA," "KK and KP" were taken close to the Georgia line. "GR" was dried at 212°; all the rest are in their natural state.

Referring to analyses, it will be noted that, with the exception of one outcrop ore, none falls below 40 per cent. of metallic iron; while on four properties where fair showings of ore exist the iron is respectively 47.83, 52.79, 54.17 and 54.625 per cent., and one deposit, as yet not determined as to extent, shows 64.89 per cent. of iron, the average of the eight analyses being 47.26 per cent. of iron; and an average taken from 23 samples representing ores throughout the territory examined shows 50.02 per cent. of iron, as stated below.

Pure metallic iron	50.020
*Oxygen, with the iron	21.090
Water	10.760
Silica	9.080
Phosphoric acid (phosphorus .712)	1.631
Sulphur	0.021
Alumina	1.710
Protosesqui oxide of manganese	5.220
Lime	0.070
Magnesia	0.040
Titanic acid	none
Organic and undermined matter and loss	0.358
Total	100.000

1.423 of phosphorus with 100 parts iron.

* A small amount of magnetic oxide present.

This shows a general average composition of all the ores sampled, and indicates that a mixture of 1 ton of iron with them would produce 2 tons of ore.

Of these analyses Mr. Britton writes: "The manganese in the above analysis is high, but it is due entirely, I believe, to a few ores which contain and excess of manganese, notably 'P. Y. & R.,' which contain 10.44 of manganese. Judging from the result of the analysis of the 24 samples, the phosphorus is high, but not unusually so; the amount of phosphorus may, like the manganese, be also reduced by throwing out one or two ores, notably 'KK & KP.' By omitting the above-mentioned samples a larger percentage of iron would be obtained and the manganese and phosphorus greatly reduced, thus making a good marketable ore. All the analyses were made of the mineral in its natural state without special drying."

That the ores produce a satisfactory metal, is evident from the reputation of the bar iron, which for 40 years was made in the crude Catalan forge fires existing in the vicinity of Murphy, wherein a partial dephosphorization took place. Although in the entire history of this now extinct industry, the ore mined would not exceed the demands of a good-sized furnace for two years, the apparently small inroads upon the supply would indicate that there is an abundance of ore available for maintaining a smelting plant of such dimensions as would permit of producing iron to sell in competition with other metal made where fuel, flux or ores of similar character exist. The forge fires which some years ago were common in the mountain regions of North Carolina, Georgia, Alabama, and Tennessee, were simply open fires, with two side walls and a back wall of masonry about 4 feet high, making a fireplace 2 feet wide by 3½ deep, often without any chimney stack. In one side a tuyere plate pierced for a "D" tuyere, 1¼ inches wide, was placed, and in the front a cinder plate supported a foreplate. Blast was furnished by a "trompe," or as it was locally known, a "water blast," being simply a vertical trunk of timber from 3 to 8 feet in hight, connecting a flume overhead with a "blast chest" beneath. A valve controlled the admission of water to the trunk and holes in its sides about mid-way between the flume, and the chest admitted air which was drawn in and carried down with the falling water. A partition in the chest sealed the outflow of the water, and allowed the air to accumulate in the upper part of the chest, from which it was conveyed in wooden pipes to the "boot," which was attached to the iron water-cooled tuyere. One, two or three fires were worked together, in connection with a trip hammer of about 800 pounds weight, operated by a cam ring, in which persimmon or hickory strikers were placed to lift the hammer. The ores used were the local brown hematites roasted and crushed fine under stamps operated by water power. These were charged into the hearth with charcoal, and two men would bloom and hammer 400 pounds of bar iron in 12 hours, raising a "loupe" of about 100 pounds every three hours. As the ores were seldom weighed, it is difficult to form a close approximation of the results obtained, but, from inquiry, fair average work required 3 tons of raw ore (yielding 45 to 50 per cent. of iron) to produce 1 ton of hammered bar. As to the fuel requird, the nearest approximation obtainable is that a 30 cord meider, yielding about 800 bushels (2688 cubic inches) of charcoal, would, according to the character of the coal, produce from 2300 to 3000 pounds of bar iron. In one test by weight 62 gross tons of ore produced 18 gross tons of blooms and 1600 pounds of hammered iron. This, allowing 10 per cent. of waste in hammering from blooms, would represent an average of consumption of 3.3 tons of ore per ton of blooms made.

MANGANESE ORES.

Throughout the region there are manganese indications, some of which are quite encouraging, but the uncertainty which has attended the deposits of manganese ores heretofore opened encourage caution in estimating upon the quality or quantity available, for there are but few manganese deposits which have been persistent. Hence it is important that such deposits as appear to offer inducements for opening by the amount of ore apparently available, and its composition, should be thoroughly tested. If found in quantity and of as good quality as some of the analyses show, these ores will be very valuable, commanding at present from 20 to 30 cents per unit of manganese at blast furnaces, according to the amount of phosphorus; thus for a 40-cent ore with phosphorus close to the maximum limit $8 per ton would be obtained, but for a 60 per cent. ore, very low in phosphorus, $18 per ton may be obtained. The ores from the district under consideration could reach Atlantic ports for foreign shipment cheaper than to any of the furnaces now smelting manganese ores to produce "spiegeleisen" or "ferromanganese." The determination of manganese ores of the district, dried at 212°, is shown in the following table.

Mr. McCreath writes as follows in regard to the table below: "The last two ores have only the phosphorus and manganese determined so that the ratio of phosphorus in 100 parts is in 100 parts manganese. All of the ores carry both baryta and cobalt, as is usual with manganese ores; but in sample 'EK' these elements are present in rather greater quantity than usual; with the exception of sample 'A,' the silica is not excessive in any of them, but it has only been determined in those suggested. 'P N' and 'J H' represent a first-class quality of manganese ore, low in phosphorus and well adapted for ferromanganese purposes." "A," "C," "H," "MD" and "EK" are from Cherokee County, North Caroina, and "P," "N" and "JH" are from Fannin County, Georgia.

	Iron.	Manganese.	Phosphorus.	Silica.	Phos. in 100 parts metal.
"A"	3.275	27.314	0.118	43.28	0.385
"C"	19.050	21.120	0.267		0.666
"H"	38.675	18.475	0.328		0.573
"MD"	5.050	49.391	0.311	1.10	0.571
"PN"	8.862	50.779	0.077	1.55	0.129
"JH"	....	53.929	0.078	....	0.145
"EK"	....	44.108	0.141	....	0.319

SMELTING PLANTS.

The forge industry having been extinguished by reason of its wastefulness and costly method, these ore deposits to be made available must either be shipped away or smelted in the vicinity. The high-grade manganese ores only would stand the freight tariff, and of these only such as are convenient to the railroads could now be shipped. If the railroad along the Valley of the Hiwassee River now projected is built, or if the Marietta and North Georgia Railroad is made standard gauge (which I learn is the intention of the present management), coke can be brought from Tennessee or Alabama, but to consider the smelting of ores with present connections charcoal must be relied upon as a fuel. The abundance of wood and the low rates ruling for charcoal make it possible to produce this fuel economically, and I was informed that it could be contracted for in quantity at 5 cents per bushel. Much of the wood required could be obtained at little or no stumpage; but as the forests are cleared, the cost of this "wood leave" would be increased, particularly as so much injury is encouraged by the lawless firing of forest lands to obtain pasture for cattle, whose aggregate value is far below the annual damage done to the timber. The timber close to the Valley and Hiwassee Rivers is not of superior quality for making charcoal, by reason of much of it having been selected for other purposes, and the damage done by fires, but there is ample good wood obtainable, which can be brought to central points cheaply, by tram or pole roads. Along the valleys of the Hiwassee, Nottla, Toccoa and Valley Rivers, there are a number of apparently good localities for the erection of plants to smelt the iron and manganese ores, where limestone can be cheaply had and charcoal obtained at a cost below the average paid throughout the United States. Labor is abundant and the country fertile, so that there would seem to be good reason for anticipating the establishment of an iron industry as soon as the district is opened by railroad communication, and it is highly probable that such communication will also afford an outlet for some of the higher grades of ores above noted.

Prof. Swire Smith, lecturing recently before a technical school at Huddersfield, England, said that while the British artisan was better provided for with respect to his physical, mental and moral well being than his French, Belgian, Austrian, German or Swiss brother, he had a far poorer chance of acquiring skill in the higher kinds of work. Technical instruction is provided wholly or almost wholly at public expense in those countries; children of the working classes are taught drawing, both from models and by example. In Germany and Switzerland evening schools continue this sort of instruction for two years after the age of 14, when compulsory attendance at school ceases. A French official recently said that he did not care if this training swelled the budget, since in a short time rich people in England and America had to pay the cost with good interest in the increased values and prices of French goods bought by them.

Chicago seems to take the lead of cities in this country in putting telegraph wires underground. Very great progress has been made in this direction, and the city authorities expect to have every pole pulled down in the business portion of the city before the end of this year. Visitors to Chicago will even now note the absence of telegraph poles as a peculiar feature of most of the principal streets of that city.

Pittsburgh seems to be keeping pace with the larger cities of the country in the way of improvements. It will be remembered that a short time ago we noted the fact that a traction company had been formed in that city to build a cable road from the city to East Liberty, a distance of about five miles, work on which has already been commenced. It is now stated that the Citizens' Company, which operates a street car line from the corner of Penn avenue and Sixth street to Sharpsburgh, a distance of about seven miles, will replace its present line with a cable road. The advantages of quick transit now being enjoyed by Chicago and Philadelphia, will no doubt soon be enjoyed by the citizens of the gas city.

The probable business of the Poughkeepsie Bridge is estimated at an enormous tonnage. The Erie road alone promises to pass over it 1000 cars a day, including coal cars. The St. Louis Bridge with its four connections on the east and three on the west earned in 1884 $1,520,483, with only $607,314.55 operating expenses. The St. Joseph Bridge over the Missouri paid dividends of 20 per cent. in 1883. The Omaha Bridge yielded an income of $800,000 in 1883, and its 8 per cent. bonds have sold as high as 120. The gross earnings of the Albany Bridge, with only two lines crossing it, have been as high as $1,500,000 a year. The Hudson River is crossed by more persons and more freight than any river in the world.

THE

Iron Age Directory

AND

Index to Advertisements.

PAGE.

Accountants, Public
Kelly Henry, Philadelphia, Pa ... 4

Air Compressors.
Clayton Air Compressor Works, Brooklyn, N. Y., and 43 Dey, New York City ... 56
Norwalk Iron Works, S. Norwalk ... 54

Anti-Friction Metals.
Reeves Paul S., Philadelphia ... 56

Anvils. *Manufacturers of.*
Eagle Anvil Works, Trenton, N. J ... 51

Arms and Ammunition.
American Arms Co., Boston, Mass ... 44
Harrington & Richardson, Worcester, Mass ... 7
J. P. Lovell's Sons, Boston, Mass ... 17
Smith L. C., Syracuse, N. Y ... 38
Smith & Wesson, Springfield, Mass ... 14

Augers and Bits.
Jennings C. E. & Co., 90 Chambers, N. Y ... 30
Livingston Horse Nail Co., 104 Reade, N. Y ... 14
New Haven Copper Co., 294 Pearl, N. Y ... 2

Axle Grease
Lovell Tracy & Co., Hartford, Conn ... 45

Axles, Springs, &c., *Manufacturers of*
Gautier Steel Dept. of Cambria Iron Co. Johnstown, Pa ... 3&48
Liggett Spring & Axle Co., Pittsburgh ... 8
Wurster F. W., Brooklyn, N. Y ... 56

Axes.
Francis Axe Co., Buffalo, N. Y ... 30
Mann, Wm., Jr., & Co ... 39
Peck A. G. & Co., Cohoes, N. Y ... 56

Babbitt Metal.
Du Plaine E. A. C., Chicago Ill ... 6
Fay, W. L. & Co., Elyria, O ... 39

Band Saws.
Prybil P., 467 W. 40th st., N. Y ... 14&51
Thompson H. G. & Sons, New Haven, Conn ... 34

Bankers.
Gallaudet P. W & Co., 2 Wall, N. Y ... 13

Bar Iron.
Lookout Iron Co., Chattanooga, Tenn ... 39
Virginia Nail and Iron Works Co., Lynchburg, Va ... 14

Barb Wire & Fence.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa ... 3
Hawkeye Steel Barb Fence Co., Burlington, Vt ... 3
Iowa Barb Wire Co., 98 Reade, N. Y ... 2
Ohio Steel Barb Fence Co, Cleveland, O ... 14
Thorn Wire Hedge Co., Chicago, Ill ... 3
Washburn & Moen Mfg. Co., Worcester ... 2

Bath Tubs.
Day Mfg. Co., Detroit, Mich ... 43

Bellows, *Manufacturers of.*
Bullock T. H., Cleveland, O ... 43
Scott Geo. M., Chicago, Ill ... 51

Bells.
Barton Bell Co., East Hampton, Conn ... 10

Bells (Sleigh).
Bevin Bros. Mfg. Co., Easthampton ... 10

Belting, *Makers of.*
Alexander Bros., 412 N. 3d, Philadelphia ... 30
Main Belting Co., Philadelphia, Pa ... 31
N. Y. Belting & Packing Co., 13 & 15 Park Row N. Y ... 13
Page Belting Co., Concord, N. H ... 13

Bicycles.
J. P. Lovell's Sons, Boston, Mass ... 17

Bird Cages, *Makers of.*
Lindeman O. & Co., 254 Pearl N. Y ... 3
Maxwell John, 247 and 249 Pearl, N. Y ... 7
Osborn Mfg. Co., 79 Bleecker, N. Y ... 15

Bits and Braces
Fray John S., Bridgeport, Conn ... 7
Saxton & Osgood, Buffalo, N. Y ... 56

Blind Awning Fixtures.
North F. O. & Co., Boston, Mass ... 7

Blocks, Tackle, *Makers of.*
Bagnall & Loud, Boston, Mass ... 11
McMillan Wm. H., 113 South, N. Y ... 11
Penfield Block Co., Lockport, N. Y ... 14
Shubert & Cottingham, Philadelphia, Pa ... 11

Blowers.
Foos Mfg Co. Springfield, Ohio ... 53

Boiler Cleaners.
Hotchkiss, Jas. W., 120 Liberty, N. Y ... 10

Boiler Plates.
Mellvain Wm. & Sons, Reading, Pa ... 52

Boilers, Steam.
Babcock & Wilcox Co., 30 Cortlandt, N. Y ... 6
Edge Moor Iron Co., Wilmington, Del ... 15
Enterprise Boiler Co., Youngstown, O ... 7
Newell Universal Mill Co., 10 Barclay, N. Y ... 51
Pollock W. B. & Co., Youngstown, O ... 53
Webb, Alfred & Co., Chattanooga, Tenn ... 39
Wetherill Robt. & Co., Chester, Pa ... 55

Bolt and Rivet Clippers.
Chambers Bros. & Co., Philadelphia ... 4
Porter & Wooster, Boston, Mass ... 2

Bolt and Screw Cases.
American Bolt and Screw Case Co., Dayton, O ... 10

Bolt Cutters.
Howard Iron Works, Buffalo, N. Y ... 55
Sellers Wm. & Co., Philadelphia, and 79 Liberty, N. Y ... 55
Wiley & Russell Mfg. Co., Greenfield, Mass ... 41-56

Books
American Well Works, Aurora, Ill ... 12

Boring Implements.
Millers Falls Co., 74 Chambers, N. Y ... 34

Brass, *Manufacture*
Ansonia Brass & Copper Co., 19 Cliff, N. Y ... 2
Bridgeport Brass Co., 19 Murray, N. Y ... 2
Davol John & Sons, 100 John, N. Y ... 2
Holmes, Booth & Haydens, 25 Park Place, N. Y ... 2
Plume & Atwood Mfg. Co., 18 Murray, N. Y ... 2
Scovill Mfg. Co., 421 Broome, N. Y ... 2
Waterbury Brass Co., 296 B'way, N. Y ... 2

Brass Butt Hinges.
Lebout W. & J., 16 & 18 Chambers, N. Y ... 34

Brass Castings.
Cahill, J. T., Chattanooga, Tenn ... 39

Brass Founders.
McFarland Wm., Trenton, N. J ... 4
I. S. Spencer's Sons, Guilford, Conn ... 51
Reeves Paul S., Philadelphia ... 56
Vulcan Works, Philadelphia, Pa ... 55

Brass Goods.
Brass Goods Mfg. Co., 88 Chambers, N. Y ... 34

Brass Hardware.
Waterbury Mfg. Co., Waterbury, Conn ... 2

Bridge Builders.
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y ... 4
Union Bridge Co., 18 Broadway, N. Y ... 49

Brokers.
Lowe & Tucker, Chattanooga, Tenn ... 39

Buckets, Pump and Elevator.
Clark W. J. & Co., Salem, O ... 40

Burglar Alarms.
Carr, Spencer E. & Co ... 3

Butcher and Shoe Knives. *Manufacturers of.*
Wilson John, Sheffield, England ... 48

Butts and Hinges
Sabin Machine Co., Montpelier, Vt ... 37
Smith & Egge Mfg. Co., Bridgeport ... 40
Union Mfg. Co., 103 Chambers, N. Y ... 7
Van Wagoner & Williams Co., 82 Beekman, N. Y ... 56

Calipers and Dividers.
Richardson C. F., Athol, Mass ... 41

Can Makers' Tools and Machines.
Crosby G. A. & Co., Chicago ... 53
Niagara Stamping and Tool Co., Buffalo ... 52

Can Openers.
Bliss & Fife Mfg. Co., West Chelmsford, Mass ... 34

Car Axles.
Roberts A. & P. & Co., 265 S. 4th, Phila ... 5

Car Wheels.
Whitney A. & Sons, Philadelphia ... 5

Carriage Hardware. *Makers of.*
E. D. Clapp Mfg. Co., Auburn, N. Y ... 6
Smith H. D. & Co., Plantsville, Conn ... 12
Woodruff, Miller & Co., Mount Carmel, Ct ... 15

Carriages.
Hotchkin Carriage Works, Syracuse, N. Y ... 10

Castings, Iron.
S. Cheney & Son, Manlius, N. Y ... 52
Haight & Clark, Albany, N. Y ... 52
Hammer & Co., Branford, Conn ... 14
I. S. Spencer's Sons, Guilford, Conn ... 51
New Howe Mfg. Co., Bridgeport, Conn ... 52
North Brothers, Philadelphia, Pa ... 5
Shepard Hdw. Co., Buffalo, N. Y ... 56
Springfield Fdry. Co., Springfield, Mass ... 12
Syracuse Mall. Iron W'ks, Syracuse, N. Y ... 4
Taylor & Boggis Fdry. Co., Cleveland, O ... 52
Waterbury Mall. Iron Co., Waterbury, Ct ... 52
Wetherill Robt. & Co., Chester, Pa ... 55

Castings, Steel.
Chester Steel Casting Co., Philadelphia, Pa ... 49
Eureka Cast Steel Co., Chester, Pa ... 56
Flagg Stanley G. & Co., Philadelphia ... 56
Johnson I. G. & Co., Spuyten Duyvil, N. Y ... 51
Pittsburgh Steel Casting Co. Pittsb'n ... 56
Pratt & Letchworth, Buffalo, N. Y ... 56
Standard Steel Casting Co., Thurlow, Pa ... 56
Syracuse Steel Foundry, Syracuse, N. Y ... 48

Cast Iron Pipe
Chattanooga Foundry and Pipe Works, Chattanooga, Tenn ... 39

Ceiling Hooks.
Perkins & Bradley Mfg. Co., New Haven, Ct ... 37

Cellar Drainer.
Aller Amos, 109 Liberty, N. Y ... 6

Cement
Johnson & Wilson, 91 Liberty, N. Y ... 56

Chains.
Bradlee & Co., 816 Richmond St., Phila ... 5
Wm. H. Haskell Co., Pawtucket, R. I ... 53

Chemicals.
Eimer & Amend, 205 Third av., N. Y ... 9

Cherry Stoners.
Enterprise Mfg. Co., Philadelphia, Pa ... 50
Goodell Co., Antrim, N. H ... 50

Chisels, *Manufacturers of.*
Buck Bros., Millbury, Mass ... 15

Chucks
Almond T. R., Brooklyn N. Y ... 51
Smith & Egge Mfg. Co., Bridgeport, Conn ... 40
Union Mfg. Co. 103 Chambers, N. Y ... 7
D. E. Whiton Mach. Co., New London, Conn ... 53

Civil and Mining Engineers.
Dickerson & Guild, Chattanooga, Tenn ... 39

Clamps.
Woodruff, Miller & Co., Mt. Carmel, Ct ... 15

Clippers, Horse and Barber's.
Lee, Jesse & Son, Philadelphia, Pa ... 40

Clock Springs, &c.
Dunbar Bros., Bristol, Conn ... 6

Coal.
Borden & Lovell, 70 West, N. Y ... 4
Etna Coal Co., Chattanooga, Tenn ... 39
Pardee A. & Co. 111 Broadway N. Y ... 48
Soddy Coal Co., Chattanooga, Tenn ... 39

Coffee and Spice Mills.
Enterprise Mfg. Co., Philadelphia, Pa ... 50
Lane Bros., Poughkeepsie, N. Y ... 34

Coke.
Etna Coal Co., Chattanooga, Tenn ... 39
Schoonmaker J. M., Pittsburgh ... 4

Commission Merchants, Iron, Steel, &c.
Howard Childs & Co., Pittsburgh, Pa ... 4
Lowe & Tucker, Chattanooga, Tenn ... 39

Copper.
New Haven Copper Co 294 Pearl, N. Y ... 2

Copying Presses.
Illinois Iron & Bolt Co., Carpentersville ... 51

Cordage.
Elizabethport Steam Cordage Co., 48 South, N. Y ... 3

Core Flour and Molasses.
Pearce S. W., Providence, R. I ... 37

Corrugated Iron.
Cincinnati Corrugating Co., Cincinnati ... 14
Knisely & Miller, Chicago, Ill ... 5
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y ... 4
Standard Iron Co., Bridgeport, Ohio ... 48

Cotters, Spring Keys, &c.
Browning, Slatin & Co., Brooklyn, N. Y ... 41

Corrugated Tubing.
Wainwright Mfg. Co., Boston ... 39

Coverings, Boiler and Pipe.
Chalmers-Spence Co., 419 Eighth, N. Y ... 9
Shields & Brown, Chicago, Ill ... 53

Cranes.
Sellers Wm. & Co., Philadelphia, Pa ... 55

Curry Combs.
Ayers & Decker Mfg. Co., Keokuk, Iowa ... 43
Southington Cutlery Co., Southington Conn ... 34

Cutlery, *Importers of.*
Clatworthy F. & W., 82 Chambers, N. Y ... 10

Cutting Tools.
Higganum Hdw. Co., Higganum, Conn ... 11

Dampers.
Shepard Hardware Co., Buffalo, N. Y ... 56
Shepard Sidney & Co., Buffalo, N. Y ... 50

Daubers.
Peabody & Parks, Troy, N. Y ... 3

Discount Books.
Williams David, 66 and 68 Duane, N. Y ... 37

Dog Collars.
Manhattan Leather Works, 298 B'way, N. Y ... 43

Dog Muzzles.
Union Hardware Co., Torrington, Conn ... 15

Door Fasteners.
Conroy P. J. & Co., Philadelphia ... 13

Door Hangers, House and Barn.
Lane Bros., Poughkeepsie, N. Y ... 45
Stearns E. C. & Co., Syracuse, N. Y ... 56
Terry Mfg. Co., Horseheads, N. Y ... 30

Door Holders.
Sise, Gibson & Co., 100 Chambers, N. Y ... 38

Door Knobs.
Boston Knob Co., Boston, Mass ... 30

Door Springs.
Coiled Wire Belting Co., 93 Cliff, N. Y ... 43

Drilling Machines.
Wiley & Russell Mfg. Co., Greenfield, Mass ... 41&56
Universal Radial Drill Co., Cincinnati ... 56

Drop Forgings.
Beecher & Peck, New Haven, Conn ... 54
Merrill Bros., 26 First, Brooklyn, E. D ... 52
Philadelphia Drop Forge Co, Phila., Pa ... 37
Wyman & Gordon, Worcester, Mass ... 52

Drop Presses.
Beecher & Peck, New Haven, Conn ... 54
Stiles & Parker Press Co., Middletown, Conn ... 56
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn ... 52

Drying Bars.
Empire Wringer Co., Auburn, N. Y ... 34

Dynamite.
Dixie Powder Co., Chattanooga, Tenn ... 39

Eave Trough Hangers.
Heartley Geo. W., Toledo, O ... 30

Edge Tools, *Makers of.*
White L. & I. J., Buffalo, N. Y ... 7

Egg Beaters.
Hamblin & Russell Mfg. Co., Worcester, Mass ... 14

Electric Lighting.
The Brush Electric Co., Cleveland, O ... 49

Electrical Supplies.
Westinghouse, Church, Kerr & Co., 17 Cortlandt, N. Y ... 12
Wollensak J. T., Chicago, Ill ... 12

Electro-Platers.
Boardman L. & Son, East Haddam, Ct ... 38
Rogers Silver Plate Co., Danbury, Conn ... 36

Elevators, *Makers of.*
Morse, Williams & Co., Philadelphia, Pa ... 55
Stokes & Parrish Machine Co., Phila ... 54

Emery Paper, Cloth, &c.
Walpole Emery Mills, South Walpole ... 34

Emery Wheels.
Diebel Mfg. Co., Philadelphia, Pa ... 51
New York Belting and Packing Co., 15 Park Row, N. Y ... 9
Northampton Emery Wheel Co., Leeds, Mass ... 55
Springfield Glue and Emery Wheel Co., Springfield, Mass ... 43
Waltham Emery Wheel Co., Waltham, Mass ... 9

Engineering Implements & Supplies
Queen & Co., Philadelphia, Pa ... 4

Engineers.
Gordon, Strobel & Laureau, Phila., Pa ... 5

Engineers and Contractors.
Lean & Blair, Pittsburgh, Pa ... 4
Waite, Van Harlingen & Mactier, Phila ... 5

Engines, Gas.
Clerk Gas Engine Co., Philadelphia, Pa ... 55
Manning A. C., 47 Dey, N. Y ... 55

Engines, Hot-Air.
McKinley Engine Co., Cincinnati, O ... 9

Engines, Steam, *Makers of.*
Leffel Jas. & Co., Springfield, O ... 13
Newell Universal Mill Co., 10 Barclay, N. Y ... 51
Payne B. W. & Sons, 4 Dey, N. Y ... 10
Prospect Machine and Engine Co., Cleveland, O ... 55
Southwark Foundry and Machine Co., Philadelphia, Pa ... 55
The Norwalk Iron Works Co., S. Norwalk ... 54
Todd Wm. & Co., Youngstown, O ... 52
Twiss N. W. New Haven, Conn ... 56
Westinghouse, Church, Kerr & Co., 17 Cortlandt, N. Y ... 12
Wetherill Robt. & Co., Chester, Pa ... 55

Engravers.
Keys & Woodbury, Worcester, Mass ... 15

Expansion Joints.
Wainwright Mfg. Co., Boston ... 39

Faucets, *Self-Measuring, Makers of.*
Enterprise Mfg. Co. of Pa., Phila. & N. Y ... 50

Fences, Wrought Iron.
Champion Iron Fence Co., Kenton O ... 46
National Wire and Iron Co., Detroit ... 3

Fencing and Cresting.
National Wire & Iron Co., Detroit, Mich ... 3

Files, *Importers of.*
Moss, F. W., 80 John, N. Y ... 48

Files and Rasps, *Manufacturers of.*
Barnett G & H., 41 & 43 Richmond, Phila ... 8
Chelsea File Works, Norwich, Conn ... 8
Everhart, James M., Scranton, Pa ... 56
J. Barton Smith Co., Philadelphia, Pa ... 8
McCaffrey & Bro., 1732 & 1734 N. 4th, Phil ... 8
Paul Chas. B., Williamsburg, N. Y ... 8

Filters.
Gate City Stone Filter Co., 46 Murray ... 37

Fire Brick, *Makers of.*
Borgner & O'Brien, Philadelphia, Pa ... 49
Gardner James, Pittsburgh, Pa ... 49
Kreischer B. & Sons, foot E. Houston, N. Y ... 49
Lowe & Tucker, Chattanooga, Tenn ... 39
Maurer H. & Son, 420 E. 23d, N. Y ... 49
Montague & Co., Chattanooga, Tenn ... 39
Newton & Co., Albany, N. Y ... 49
Ostrander James & Son, Troy, N. Y ... 49
Birmingham Fire Brick Works, Birmingham, Ala ... 49
Union Mining Co., Philadelphia, Pa ... 49
Valentine M. D. & Bro., Woodbridge ... 49

Fishing Tackle.
Dame, Stoddard & Kendall, Boston, Mass ... 10

Flour Sifters
The Fred. J. Myers Mfg. Co., Covington, Ky ... 37

Forges, Portable, &c.
Bradley & Co., Syracuse, N. Y ... 14&56
Brown & Patterson, Brooklyn, N. Y ... 7
Bullock, T. H., Cleveland, O ... 43
Buffalo Forge Co., Buffalo N. Y ... 14&53
Sturtevant B. F., Boston, Mass ... 54

Forgings, Iron and Steel.
Hicks & Dickey, Philadelphia, Pa ... 4

Foundry Facings.
Paxson J. W. & Co., 514 Beech, Phila ... 5
S. Obermayer Foundry Supply Mfg. Co., Cincinnati, O ... 15

Foundry Supplies.
S. Obermayer, Foundry Supply Mfg. Co., Cincinnati, O ... 15
Paxson J. W. & Co., Philadelphia ... 5

Frame Pulleys.
Palmer Mfg. Co., Troy, N. Y ... 43

Friction Clutches.
Jas. Smith Woolen Mchy. Co., Phila, Pa ... 55
Moore & White, Philadelphia, Pa ... 55

Fry Pans.
N. Y. Stamping Co ... 31

Garden Tools.
Dunlap, C. W., 95 Reade, N. Y ... 41

Gear Cutters.
D. E. Whiton Mach. Co., New London, Conn ... 53

Glass Boards.
Lufkin Rule Co., Cleveland, O ... 45

Glass Cutters
Monce, S. G., Bristol Conn ... 43

Grease Cups.
The Walker Mfg. Co., Cleveland, O ... 53

Granite Ironware.
St. Louis Stamping Co ... 50

Grate Bars.
Traud A., Newark, N. J ... 14

Grindstone Dressing Machinery.
Blake & Johnson, Waterbury, Conn ... 3

Grindstones.
Cleveland Stone Co., Cleveland, O ... 38
Lake Huron Stone Co., Detroit and Chicago ... 38
Wood, Walter R., 283 and 285 Front, N. Y ... 38

Gunpowder. *Makers of*
King's Great Western Powder Co., Cincinnati, Ohio ... 50
Laflin & Rand Powder Co., 29 Murray, N. Y ... 15

Hack Saws.
Thompson H. G. & Sons, New Haven, Conn ... 34

Hammers.
Buffalo Hammer Co., Buffalo, N. Y ... 51

Hammers, Steam.
Bradley & Co., Syracuse, N. Y ... 56

Hand Force Pumps.
Union Mfg. Co., 103 Chambers, N. Y ... 7

Hardening Powder.
Adamant Powder Co., 171 and 176 Pearl, N. Y ... 46

Hardware Comm'n Merchants.
Doscher & Dixon 88 Chambers, N. Y ... 10
Field Alfred & Co., 93 Chambers, N. Y ... 10

Hardware Importers.
Warner, J. H. & Co., Chattanooga, Tenn ... 39

Hardware Manufacturers.
Bingham W. & Co., Cleveland, Ohio ... 30
Enterprise Mfg. Co., Philadelphia ... 50
Union Mfg. Co., 103 Chambers, N. Y ... 7

Hardware Manufacturers' Agents.
M'Carty, J. C. & Co., 97 Chambers, N. Y ... 18

Hardware Shelf Boxes.
Green S. H., 22 Park Place, N. Y ... 30
Jones Jesse & Co., Philadelphia, Pa ... 45

Hardware Specialties.
Acme Shear Co., Bridgeport, Conn ... 12
Bingham W. & Co., Cleveland, Ohio ... 30
Rex A. C. & Co., Philadelphia, Pa ... 13
Saxton & Osgood, Buffalo, N. Y ... 56
Shepard Hardware Co., Buffalo, N. Y ... 56
The Wire Goods Co., Worcester, Mass ... 2
Underhill, Clinch & Co., 91 Chambers N. Y ... 10

Hardware, Theatrical.
Martin Samuel, 127 Eighth av., N. Y ... 46

Harness Snaps.
Covert Mfg. Co., West Troy, N. Y ... 38

Hay Carriers
Myers F. E. & Bro., Ashland, O ... 7

Hay Knives.
Hiram Holt & Co., East Wilton, Me ... 8
New London Scythe Co., Scytheville, N. H ... 8
North Wayne Tool Co., Hallowell, Me ... 8

Hinges.
Union Mfg. Co. 103 Chambers, N. Y ... 7

Hog Ringers.
Chambers, Bering & Quinlan Co., Decatur ... 46

Hoisting Machines.
Box Alfred & Co., 314 Green, Phila ... 53
Harrington E., Son & Co., Philadelphia ... 55
Lidgerwood Mfg. Co., 96 Liberty, N. Y ... 53
Morse, Williams & Co., Philadelphia, Pa ... 55
Sellers Wm. & Co., Philadelphia, and 79 Liberty st., N. Y ... 55
Teal Hoist Co., Philadelphia ... 13

Hooks (Cotton & Bale).
New York Handle & Mallet Works, 456 E. Houston, N. Y ... 13

Horse Nails. *Makers of.*
Essex Horse Nail Co., Essex, N. Y ... 45
National Horse Nail Co., Vergennes Vt ... 54

Horse Shoes. *Makers of*
Hague J. B. & Co., Trapalean, Ohio ... 31
Phoenix Horse Shoe Co., Poughkeepsie, N. Y ... 4
Rhode Island Horse Shoe Co., Providence ... 4
The Burden Iron Co., Troy, N. Y ... 4

Hot-Blast Stoves.
Witherow James P., Pittsburgh, Pa ... 37

Hydrants, &c.
McLean John, 296 & 298 Monroe, N. Y ... 19

Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y ... 53
McCoy & Sanders, 26 Warren, N. Y ... 52
Watson & Stillman, 204 E. 43d, N. Y ... 55

Hydraulic Motors.
Amherst Hydraulic Motor Co., Holyoke, Mass ... 30

Ice Cream Freezers.
Gooch Freezer Co., Cincinnati, O ... 12

Ice Cutting Machines.
Abendroth G. Irving, 28 Cliff, N. Y ... 38

Insurance, Boiler.
Hartford Steam Boiler Inspection & Insurance Co ... 52

Iron. *Manufacturers' Agents.*
Cox Justice, Jr., & Co., 333 Walnut, Phil ... 5
Hicks & Dickey, Philadelphia, Pa ... 4
Hoffman J. W. & Co., 208 S. 4th, Phila ... 5
Levis Henry & Co., Philadelphia, Pa ... 5

Iron, *Manufacturers of.*
Alan Wood Co., Philadelphia ... 5
Burden Iron Co., Troy, N. Y ... 4
Leonard John, 451 West St., N. Y ... 4
Moorhead & Co., Pittsburgh, Pa ... 6
Montour Iron & Steel Co., Danville, Pa ... 48
Phoenix Iron Co., 410 Walnut, Phila ... 5
Plymouth Rolling Mill Co., Conshohocken, Pa ... 5
Riverside Iron Works, Wheeling, W. Va ... 41
The Passaic Rolling Mill Co., Paterson ... 4
The Wilmot & Hobbs Mfg. Co., Bridgeport ... 52
Troy Steel and Iron Co., Troy, N. Y ... 48
Whitney A. R. & Co., 58 Hudson, N. Y ... 4

Iron and Steel, Swedish.
Lewander & Co., Boston, Mass ... 49
Page, Newell & Co., Boston, Mass ... 49

Iron Brokers.
Etting Edward J., Philadelphia, Pa ... 5
Fox John, 160 Broadway, N. Y ... 4
Walbaum W. H., Philadelphia, Pa ... 5

Iron Commission Merchants.
Hart Wm. R. & Co., Philadelphia, Pa ... 5
John L. Hogan, Philadelphia, Pa ... 5
Lea J. Tatnall & Co., Philadelphia ... 5
Lundberg Gustaf, Boston, Mass ... 49
Mohr J. J., 430 Walnut, Philadelphia ... 5
Tyler Bros., Boston, Mass ... 2
Wister L. & R. & Co. Philadelphia, Pa ... 5

Iron Dealers.
Abeel Brothers, 190 South, N. Y ... 4
Abbott Jere & Co., N. Y. and Boston ... 49
Bonnell, Botsford & Co., Youngstown ... 4
Borden & Lovell, 70 and 71 West, N. Y ... 4
Cooney Daniel F., 88 Washington, N. Y ... 4
Cox Justice, Jr., & Co., Philadelphia ... 5
Esherick & Co., Philadelphia, Pa ... 5
Hart, Wm. R. & Co., Philadelphia ... 5
Himrod Chas. & Co., Chicago, Ill ... 4
Hoffman J. W. & Co., 208 S. Fourth, Phil ... 5
Judson B. F., 457 and 459 Water, N. Y ... 4
Keeley Jerome & Co., Philadelphia, Pa ... 5
Lindsay, Parvin & Co., Philadelphia ... 5
Logan James H., Pittsburgh, Pa ... 48
Lundberg Gustaf, 38 Kilby, Boston ... 49
Lundell Chas. G., Boston, Mass ... 49
Naylor & Co., 99 John, N. Y ... 48
Ogden & Wallace, 85 to 91 Elm, N. Y ... 4
Pierson & Co., 24 to 27 West, N. Y ... 4
Pullman J. Wesley, Philadelphia ... 5
Wallace Wm. H. & Co., Albany & Washington streets, N. Y ... 4
Wilson E. H. & Co., Philadelphia, Pa ... 5
Whitney A. R. & Co., 17 Broadway, N. Y ... 4&34

Iron Grates.
Valley Forge and Foundry, Knoxville, Tenn ... 39

Iron Pig, *Importers of*
Abbott Jere & Co. (Swedish), New York & Boston ... 49
Williamson James & Co. 63 Wall, N. Y ... 4

Iron Planers.
Tower & Lyon, 95 Chambers, N. Y ... 46
Brettell, Geo. E., Rochester, N. Y ... 41

Iron Sheet. *Manufacturers of*
Everson, Hammond & Co., Pittsburgh, Pa ... 4
Standard Iron Co., Bridgeport, O ... 48
W. D. Wood & Co., Limited, Pittsburgh ... 4

Iron, Steel and Nails.
Morris, Wheeler & Co., 14 Cliff N. Y ... 5

Ironwork, Ornamental.
Champion Iron Fence Co., Kenton, O ... 46

Kegs.
National Keg Works, Birmingham, Ct ... 12

Keys.
Wollensak, J. T., Chicago, Ill ... 12

Knife-Polishing Machines.
Francis T. Witte Hdw. Co., 106 Chambers, N. Y ... 13

Lanterns.
Romer & Co., Newark, N. J ... 40

Lathes.
Harrington, E. & Son, Philadelphia ... 55
Prybil P., 467 W. 40th, N. Y ... 14&51
Sebastian, May & Co., Cincinnati, O ... 11

Lawn Mowers.
Blair Mfg. Co., Springfield, Mass ... 43
Chadborne & Coldwell Mfg. Co., Newburg, N. Y ... 43
Lloyd & Supplee Hdw. Co., Phila., Pa ... 42
Mast, Foos & Co., Springfield, O ... 43

Levels.
Green, Tweed & Co., 83 Chambers, N. Y ... 14
Richardson C. F., Athol, Mass ... 41

Locks and Knobs, *Manufacturers of.*
Dietz A. E., 97 Chambers, N. Y ... 34
Smith & Egge Mfg. Co., Bridgeport ... 40
J. E. Quackenbush & Sons, 535 Eighth av., N. Y ... 37
Yale & Towne Mfg. Co., Stamford, Conn ... 11

Lumber.
Hughes D. W. Chattanooga, Tenn ... 39

Machinery.
Adt John & Son, New Haven, Conn ... 50
Barnes W. F. & John, Rockford, Ill ... 54
Cox & Sons, Philadelphia Pa ... 52
Forbes & Curtis, Bridgeport, Conn ... 55
Garvin E. E. & Co., 139 Centre, N. Y ... 51
Harrington E & Son, Philadelphia ... 55
Hendy Machine Co., Torrington, Conn ... 53
Israel H. Johnson, Jr., & Co., Phila., Pa ... 55
Prybil P., 467 W. 40th, N. Y ... 14 & 51
Pittsburgh Mfg. Co., Pittsburgh, Pa ... 53
Sellers Wm. & Co., Philadelphia, and 79 Liberty, N. Y ... 55
Southwark Foundry and Machine Co. Philadelphia, Pa ... 55
Stokes & Parrish Machine Co., Philadelphia, Pa ... 54
Stow Flexible Shaft Co., Ld., Phila ... 55
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn ... 52
Wetherill Robert & Co., Chester, Pa ... 55
Wood Thos. & Co., Philadelphia, Pa ... 51
Woodward & Rogers, Hartford, Conn ... 55

Machinists' Scales.
Collin & Leighton, Syracuse, N. Y ... 13

Machinists' Tools and Supplies.
Blaisdell P. & Co., Worcester, Mass ... 53
Harrington E., Son & Co., Philadelphia, Pa ... 55
King J. M. & Co., Waterford N. Y ... 8
Sellers Wm. & Co., Philadelphia, and 79 Liberty, N. Y ... 55

Mallets.
N. Y. Handle & Mallet Works, 456 E. Houston ... 13

Manufacturers' Agents.
Coolidge & Buck, Chattanooga, Tenn ... 39

Measuring Faucets.
Lane Bros., Poughkeepsie, N. Y ... 34

Metals.
Dickerson, Van Dusen & Co., 29 and 31 Cliff, N. Y ... 2
Fearing Wm. S., 100 Chambers, N. Y ... 11
Naylor & Co., 99 John, N. Y ... 48
Phelps, Dodge & Co., Cliff st., N. Y ... 2

Metallurgists.
Booth, Garrett & Blair, 919 Chant, Phila ... 5
Britton J. Blodgett, 330 Walnut, Phila ... 48

Mine Lamps.
Hunt & Connell, Scranton, Pa ... 41
Leonard Bros., Scranton ... 41

Mining and Furnace Supplies.
James, C. E. & Co., Chattanooga, Tenn ... 39

Molding Sand.
Paxson J. W. & Co., 514 Beach, Phila ... 5

Mouse Traps.
Ripley Mfg. Co., Unionville, Conn ... 51

Nail Machinery.
Pittsburgh Mfg. Co., Pittsburgh, Pa ... 53

Nail Sets.
Graham, J. H. & Co., 113 Chambers, N. Y ... 8
The Edward Storm Spring Co., Poughkeepsie, N. Y ... 15

Nails.
Borden & Lovell, 70 West, N. Y ... 4
E. & G. Brooke Iron Co., Birdsboro ... 6
Cobb's Iron and Nail Co., Aurora, Ind ... 37
Cumberland Nail & Iron Co, Phila ... 5
Fuller Bros. & Co., 139 Greenwich, N. Y ... 4
Oxford Iron Co., 81 Washington N. Y ... 4
Riverside Iron Works, Wheeling, W. Va ... 41
Stebbins C. J., 104 Reade, N. Y ... 4
Terre Haute Iron and Nail Works ... 6
Virginia Nail and Iron Works Co., Lynchburg, Va ... 14

Nails, Cut.
Blankenship R. E., Richmond, Va ... 6
Borden & Lovell, 70 West, N. Y ... 4

Nickel Platers' Supplies.
Hanson, Van Winkle & Co., Newark, N. J ... 51
The Zucker & Levett Chemical Co., 540 to 544 West 16th, N. Y ... 27

Norway Shapes, *Rollers of.*
Naylor & Co., 99, John, N. Y ... 48
Rowland William & Harvey, Frankford Philadelphia ... 56

Nuts, Bolts, &c., *Makers of.*
American Bolt Co., Lowell, Mass ... 40
Columbus Bolt Works, Columbus, O ... 30
Port Chester Bolt and Nut Co., Port Chester, N. Y ... 40
The Allentown Rolling Mills, Allentown ... 5
Wm. H. Haskell Co., Pawtucket, R. I ... 52
Russell, Burdsall & Ward, Port Chester ... 56
Wilson J. Fred., Worcester, Mass ... 40

Oil Stones.
Chase Geo. 107th & Harlem River, N. Y ... 38
A. F. Pike Mfg. Co., Pike Station, N. H ... 46

Oil Stoves.
American Oil Stove Co., Gardner, mass ... 36
Florence Machine Co., Florence, Mass ... 50

Ore Jigs.
MacLanahan & Stone, Hollidaysburg, Pa ... 37

Ox Shoes.
Woodruff, Miller & Co., Mount Carmel Conn ... 15

Packing.
Chalmers-Spence Co., 419 Eighth, N. Y ... 9
Jenkins Bros., 71 John, N. Y ... 56
N. Y. Belting and Packing Co., 13 and 15 Park Row, N. Y ... 13

Padlocks.
Romer & Co., Newark, N. J ... 40

Paint.
Felton, Rau & Sibley, Phila., Pa ... 40

Patent Solicitors.
Howson & Son, Phila. and Washington ... 38
Stocking E. B., Washington, D. C ... 38

Peach and Apple Parers.
Sayre, L. A., Newark, N. J ... 37

Perforated Metal.
Harrington & King Perforating Co., Chicago, Ill ... 16

Phosphor Bronze.
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia ... 3

Picture Hangers.
Wilkinson E., Paterson, N. J ... 36

Pig Iron.
Chattanooga Iron Co., Chattanooga ... 39
Citico Furnace Co., Chattanooga, Tenn ... 39
Condit, Fuller & Co., Cleveland, Ohio ... 4
Hart Wm. R. & Co., Philadelphia, Pa ... 5
Montour Iron and Steel Co., Reading, Pa ... 48
Roane Iron Co., Chattanooga, Tenn ... 39
Walker Iron Co., Chattanooga, Tenn ... 39

Pipe Cutters.
Forbes & Curtis, Bridgeport, Conn ... 55
Pancoast & Maule, Philadelphia ... 54

Pipes, Fittings, &c., *Makers of.*
McNab & Harlin Mfg. Co., 56 John, N. Y ... 53

Pipe, Water and Gas, *Makers of.*
Donaldson Iron Co ... 4
Fox John, 160 Broadway, N. Y ... 4
Hooven Jas. & Sons, Norristown, Pa ... 15
Reading Iron Works, Philadelphia, Pa ... 6
Wood R. D. & Co., 400 Chestnut, Phila ... 4
Wyckoff A. & Son, Elmira, N. Y ... 51
Wyckoff Pipe Co., Williamsport, Pa ... 15

Plane Irons, *Manufacturers of.*
Buck Bros., Millbury, Mass ... 13

Planes, *Manufacturers of.*
Stanley Rule & Level Co., 29 Chambers, N. Y ... 9

Plated Ware.
Hall, Elton & Co., 47 E. 13th, N. Y ... 11
The Rogers & Hamilton Co. Waterbury, Conn ... 9

Platers' Supplies.
Eddy Electric Mfg. Co., Hartford, Conn ... 8

Plumbers' Tools.
Osborne C. S. & Co., Newark, N. J ... 10

Post-Hole Diggers.
Chieftain Hay Rake Co., Canton, O ... 41

Poultry Nettings.
Clinton Wire Cloth Co., Clinton, Mass ... 3
"Silver Finish" ... 2

Power Hammers.
Belden S. A. & Co., Danbury, Conn ... 52
Bradley & Co., Syracuse, N. Y ... 56
Dienelt & Eisenhardt, Philadelphia, Pa ... 54
Duncan W. P. & Co., Bellefonte, Pa ... 9
Stiles & Parker Press Co., Middletown, Conn ... 56

Power Punches and Shears.
Niagara Stamping & Tool Co., Buffalo ... 52

Presses, Dies, &c.
Crosby G. A. & Co., Chicago, Ill ... 53
E. W. Bliss Co., Brooklyn, N. Y ... 16
Ferracute Machine Co., Bridgeton, N. J ... 54
Niagara Stamping & Tool Co., Buffalo ... 52
Stiles & Parker Press Co., Middletown, Conn ... 56

Presses, Power, *Makers of.*
Merriman A. H., West Meriden, Conn ... 54
Niagara Stamping & Tool Co., Buffalo ... 52
Stiles & Parker Press Co., Middletown ... 56
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn ... 52

Pressure Regulators.
Watson & McDaniel, Philadelphia, Pa ... 40

Printing.
Williams Printing Co., 7 & 9 Elm, N. Y ... 8

Property for Sale or Lease.
Meredith Wm. T., 48 Wall, N. Y ... 49

Pulleys.
Walker Mfg. Co., Cleveland, O ... 54

Pumps, Force.
Clark Brothers, Belmont, N. Y ... 51
Myers F. E. & Bro., Ashland, O ... 7
Union Mfg. Co., 103 Chambers, N. Y ... 7

Pumps, *Makers of.*
Douglas W. & B., Middletown, Conn ... 7
Shepherd Mfg. Co., Union City, Conn ... 51
Silver & Deming Mfg. Co., Salem, O ... 7
Union Mfg. Co., 103 Chambers, N. Y ... 7

Pumping Machinery.
Dean Bros. Steam Pump Works, Indianapolis, Ind ... 52

Punching and Shearing Presses.
Heartley Geo. W., Toledo, O ... 30
Stiles & Parker Press Co., Middletown, Conn ... 56
Watson & Stillman, 204 E. 43d, N. Y ... 55

Pyrometers.
Brown, Edward, Philadelphia Pa ... 9

Radius Link Planer Attachment.
Pedrick & Ayer, Philadelphia, Pa ... 55

Rails, Iron and Steel.
Allentown Rolling Mills, Allentown ... 5
Cambria Iron Co., Johnstown Pa ... 5
Eckstein, Chas. G., & Co., 32 Liberty, N. Y ... 49
Joliet Steel Co., 11 Pine, N. Y ... 48
Montour Iron & Steel Co., Danville ... 48
Scranton Steel Co., 56 Broadway, N. Y ... 48

Railway and Machinists' Supplies.
Rogers H. A., 19 John, N. Y ... 13
Stone & Ewing, Chattanooga, Tenn ... 39

Rakes, Hand.
Gibbs Lawn Rake Co., Canton, O ... 10

Rat Traps.
Hotchkiss, E. S., 113 Chambers, N. Y ... 46

Razors.
J. R. Torrey & Co., Worcester, Mass ... 10

Resolvents.
International Mfg. Co., Cleveland, O ... 4

Respirators.
Morley Respirator Co., East Saginaw, Mich ... 40

Rivets.
Grundy & Disosway, 195 Greenwich, N. Y ... 13
Old Colony Rivet Co., Kingston, Mass ... 2
Plymouth Mills, Plymouth, Mass ... 2
Reed & Prince, Worcester, Mass ... 11
Townsend W. P. & Co., Pittsburgh, Pa ... 53

Rock Drills
Clayton Air Compressor Works, Brooklyn, N. Y., and 43 Dey, New York ... 56

Roofing.
Garry Iron Roofing Co., Cleveland, O ... 8

Rolling Mill Machinery.
Robinson-Rea Mfg. Co., Pittsburgh, Pa ... 4

Roofing Bracket.
Ryan P. W., Marlboro, Mass ... 7

Roofing Plates.
Anglo Am Roofing Co., Pittsburgh, Pa ... 57

Rubber Valves.
Wyckoff A. & Son, Elmira, N. Y ... 51

Rules, *Manufacturers of.*
Stanley Rule & Level Co., 29 Chambers, N. Y ... 9

Sad Irons.
Enterprise Mfg. Co., Philadelphia ... 50

Sash Cords and Chains.
Morton Thos., 65 Elizabeth, N. Y ... 12
Smith & Egge Mfg. Co., Bridgeport ... 40
Tolman J. P. & Co., Boston, Mass ... 49

Sash Fixtures.
Gantenberg, B., Covington, Ky ... 6
Hugunin R. B., Hartford, Conn ... 31
Willingham & Co., Chattanooga, Tenn ... 39

Sash Locks.
Ives H. B. & Co., New Haven, Conn ... 38
Reading Lock Mfg. Co., Reading, Pa ... 56
Sise, Gibson & Co., 100 Chambers, N. Y ... 40

Sash Pulleys.
Empire Portable Forge Co., Cohoes, N. Y ... 43

Sash Weights.
Ross W. A. & Bros., 56 Pine, N. Y ... 43

Saw Sets.
Morrill Chas., 64 College Place, N. Y ... 46

Saws, *Makers of.*
Atkins E. C. & Co., Indianapolis, Ind ... 42
Chattanooga Saw Works, Chattanooga, Tenn ... 39
Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y ... 14

Scales, *Manufacturers of.*
Buffalo Scale Co., Buffalo, N. Y ... 38
Chatillon John & Sons, 85-89 Cliff, N. Y ... 9
Riehle Bros., Philadelphia ... 8
Southwark Scale Co., Philadelphia, Pa ... 34

Scrapers, Road.
Kilbourne & Jacobs Mfg. Co., Columbus ... 38

Screens, Window and Door.
Porter Mfg. Co., Burlington, Vt ... 46

Screw Cutting Machinery.
Wiley & Russell Mfg. Co., Greenfield, Mass ... 41-56

Screw Drivers.
Diebel Mfg. Co., Philadelphia, Pa ... 36
Decatur Coffin Co., Decatur, Ill ... 46
Ellrich Hdw. Mfg. Co., Plantsville, Conn ... 10
The Alford & Berkele Co., 77 Chambers N. Y ... 30
Thomas C. & Co., Birmingham, Conn ... 9

Screw Plate and Pipe Cutter.
Jarecki Mfg. Co., Erie, Pa ... 55

Screws, *Makers of.*
Wm. H. Haskell Co., Pawtucket ... 53
Miles F. S., 205 Quarry, Philadelphia ... 6

Scroll Saws.
Seneca Falls Mfg. Co., Seneca Falls, N. Y ... 56

Scythe Stones and Whetstones.
Cleveland Stone Co., Cleveland, O ... 38
Lake Huron Stone Co., Detroit and Chicago ... 38
A. F. Pike Mfg. Co., Pike Station, N. H ... 46

Shafting, *Makers of.*
Cresson Geo. V., Philadelphia, Pa ... 55
Pierson & Co., 24 to 27 West, N. Y ... 4

Shears, Iron.
E. W. Bliss Co., Brooklyn, N. Y ... 16

Shears and Scissors.
Acme Shear Co., Bridgeport, Conn ... 12
Clayton Bros., Bristol, Conn ... 10
Cleveland Machine Co., Cleveland, O ... 10
Henry Seymour Cutlery Co., 84 Chambers, N. Y ... 10
Schollhorn Wm. & Co., New Haven, Conn ... 10

Sheep Shears.
Henry Seymour Cutlery Co., 84 Chambers, N. Y ... 10

Ship Chandlery Hardware.
Ferdinand L. W. & Co., Boston, Mass ... 36

Shovels, Spades and Scoops.
Bruce George W., 24 Duane, N. Y ... 15
Hussey, Binns & Co., Pittsburgh, Pa ... 14

Show Cases.
Eureka Show Case Co ... 48

Silverware.
R. Wallace & Sons Mfg. Co., Wallingford, Conn ... 46

Sinks.
Douglas W. & B., Middletown, Conn ... 7
Stearns E. C. & Co., Syracuse, N. Y ... 56

Smelting Works.
Reeves Paul S., 760 S. Broad, Phila ... 56

Speaking Tubes.
Ostrander W. R. & Co., 21 & 23 Ann, N. Y ... 51
Wollensak, J. F., Chicago, Ill ... 52

Special Notices.
Business Opportunities ... 18
Help Wanted ... 18
Machinery ... 19
Situations Wanted ... 18

Speed Indicators.
Montgomery & Co., 105 Fulton, N. Y ... 15

Spelter.
Manning & Squier, 113 Liberty, N. Y ... 2

Springs.
Morgan Spring Co., Worcester, Mass ... 3
Sabin Machine Co., Montpelier, Vt ... 37
Titus & Babcock, Rochester, N. Y ... 10
Tuck Mfg. Co., Brockton, Mass ... 6

Sprinklers, Lawn.
McGowan, John H. & Co., Cincinnati, O ... 4

Spring Hinges.
Union Mfg. Co. 103 Chambers, N. Y ... 7

Stamping Works.
Niagara Stamping and Tool Co., Buffalo, N. Y ... 52

Steam Hammers, &c. *Makers of.*
Dienelt & Eisenhardt, Philadelphia ... 54
Dudgeon Richard, 24 Columbia, N. Y ... 53

Steam Pumps, &c., *Manufacturers.*
McGowan John H. & Co., Cincinnati, O ... 54
Norwalk Iron Wks. Co., So. Norwalk ... 54

Steam Traps.
Curtis Regulator Co., Boston, Mass ... 13
Watson & McDaniel, Philadelphia, Pa ... 40

Steel Balls.
Simonds Rolling Machine Co ... 52

Steel Figures and Alphabets.
Bellows & Dickey, Cleveland, O ... 4
Stutzman J. M., 181 William, N. Y ... 9

Steel Importers.
Abbott Jere & Co., New York & Boston ... 49
Hobson Francis & Son, 97 John, N. Y ... 48
Jessop Wm. & Sons, Sheffield, Eng., or 91 John, N. Y ... 48
Newton & Shipman, 83 John, N. Y ... 48
Page, Newell & Co., Boston, Mass ... 49
Pierson & Co., 24 to 27 West, N. Y ... 4
Whitney A. R. & Co., 17 B'dway, N. Y ... 4&34

Steel (Mushet's Special).
Jones B. M. & Co., 11 & 13 Oliver, Boston ... 48

Steel Manufacturers.
Asbeck, Osthaus, Eicken & Co., Hagen, Westphalia ... 49
Burrows Thos. C., 99-101 John, N. Y ... 6
Chester Steel Castings Co., Philadelphia, Pa ... 49
Chrome Steel Works, Brooklyn, E. D. N. Y ... 53
Collins H. E. & Co., Pittsburgh, Pa ... 48
Frankford Steel Co., Philadelphia, Pa ... 6
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa ... 48
Hartman Steel Co., Pittsburgh, Pa ... 9
Jessop Wm. & Sons, Sheffield, Eng., or John, N. Y ... 48
Midvale Steel Co., Nicetown, Phila ... 5
Miller, Metcalf & Parkin, Pittsburgh ... 48
Moorhead & Co., Pittsburgh, Pa ... 6
Moss F. W., 83 John, N. Y ... 48
Naylor & Co., 99 John, N. Y ... 48
Pennsylvania Steel Co., Steelton, Pa ... 48
Plymouth Rolling Mill Co., Conshohocken, Pa ... 5
Riverside Iron Works, Wheeling, W. Va ... 6
Rowland Wm. & Harvey, Frankford Philadelphia ... 56
Singer, Nimick & Co., Pittsburgh, Pa ... 6
Smith Bros. & Co., Pittsburgh, Pa ... 48
Standard Steel Works, Philadelphia, Pa ... 5
The Wilmot & Hobbs Mfg. Co., Bridgeport, Conn ... 52
Troy Steel and Iron Co., Troy, N. Y ... 48
Wardlow S. & C., Sheffield, Eng ... 48
Wetherell Bros., 115 Liberty, N. Y ... 48
Wilson Hawksworth, Ellison & Co., Sheffield, England ... 48

Steel, *Manufacturers' Agents.*
Hicks & Dickey, Philadelphia, Pa ... 4

Steel Nails
Brooklyn Wire Nail Co., Brooklyn, N. Y ... 2
Jefferson Iron Works, Steubenville, O ... 53
Jones & Laughlins, Limited, Chicago ... 47

Steel Rolls.
Garrison A. & Co., Pittsburgh, Pa ... 4
Seaman, Sleeth & Black, Pittsburgh, Pa ... 48

Steel, Sheet.
Standard Iron Co., Bridgeport, O ... 48

Steel Spiral Springs, *Manufacturers*
Cary & Moen, 234 W. 29th, N. Y ... 3
Chatillon John & Sons, 85 to 89 Cliff, N. Y ... 9
Rowland Wm. & Harvey, Frankford, Philadelphia ... 56

Steel, Tool.
The Bolton Steel Co., Canton, O ... 48
Frankford Steel Co., Philadelphia, Pa ... 6
Jessop Wm. & Sons, Sheffield, Eng., 91 John, N. Y ... 48
Leng John S., 4 Fletcher, N. Y ... 56
Smith Bros. & Co., Pittsburgh, Pa ... 48

Stocks and Dies.
Butterfield & Co., Derby Line, Vt ... 54
Wiley & Russell Mfg. Co., Greenfield, Mass ... 41&56

Stone Crushers.
Totten & Co., Pittsburgh, Pa ... 43

Stove Linings.
Ostrander Jas. & Son, Troy, N. Y ... 49

Swings.
The F. F. Adams Co., Erie, Pa ... 7

Tack and Nail Machinery.
Sweetser W. A., Brockton, Mass ... 51

Tacks and Staples.
Cobb & Drew, Plymouth, Mass ... 13
Florence Tack Co., Florence, Mass ... 11
Grundy & Disosway, 195 Greenwich, N. Y ... 13
Keith & Trufant, Campello, Mass ... 13
New Haven Staple Works, New Haven ... 40
Phillips, E. & Sons, South Hanover, Mass ... 13

Tacks, Brads, &c.
American Tack Co., Fairhaven, Mass ... 6
Walkley Hdw. Co., Plantsville, Ct ... 7

Tacks, Nails, &c.
Plymouth Mills, Plymouth, Mass ... 2

Taps and Dies.
Butterfield & Co., Derby Line, Vt ... 54
Manning, Maxwell & Moore, 111 Liberty N. Y ... 54
Wiley & Russell Mfg. Co., Greenfield Mass ... 41&56
Worswick Mfg. Co., Cleveland, O ... 51

Testing Machines.
Riehle Bros., Philadelphia ... 8

Tinware.
Scheider Joseph & Co., Brooklyn, N. Y ... 13

Tin Zinc.
American Tin Zinc Co., 85 Beaver ... 31

Tire Upsetters.
Callahan & Douglass, Binghamton N. Y ... 55

Toe Calks, Steel.
Burke P F., Boston, Mass ... 14

Tools.
Atkins E. C. & Co., Indianapolis Ind ... 42
Britannia Co., London, England ... 56
Bullock O. W., Springfield, Mass ... 13
Starrett L. S., Athol, Mass ... 57

Tools and Machines (Tinners').
Niagara Stamping and Tool Co., Buffalo ... 52

Tools, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn ... 55
D. Saunders' Sons, Yonkers, N. Y ... 52
Forbes & Curtis, Bridgeport, Conn ... 55

Transom Lifters.
Reiher F. A. & Co., Chicago, Ill ... 43
Wollensak J. F., Chicago, Ill ... 15&40

Trousers Stretchers.
Thompson E. O., Philadelphia, Pa ... 40

Trucks, *Manufacturers of.*
Byram & Co., Detroit, Mich ... 19
Lansing Wheelbarrow Co., Lansing, Mich ... 50
Penfield Block Co., Lockport, N. Y ... 14
Riehle Bros., 9th, above Master, Phila ... 8

Tube Scrapers.
Chalmers-Spence Co., 419 Eighth, N. Y ... 9

Tubes, Seamless Drawn Copper.
Bridgeport Brass Co. 19 Murray, N. Y ... 2

Tumbling Barrels.
Henderson Bros., Waterbury, Conn ... 4

Turnbuckles.
Cleveland City Forge and Iron Co., Cleveland, O ... 52
Merrill Bros., 26 First st., Brooklyn, E. D ... 52

Twist Drills, *Makers of.*
Cleveland Twist Drill Co., Cleveland O ... 51
Morse Twist Drill & Machine Co., New Bedford, Mass ... 51
New Process Twist Drill Co., Taunton Mass ... 51
Syracuse Twist Drill Co., Syracuse, N. Y ... 10
The Standard Tool Co., Cleveland, O ... 51

Umbrella Racks.
Covert E. & J. C., Farmer Village, N. Y ... 37

Upright Drills.
Burnham Geo. & Co., Worcester, Mass ... 10

Valves, Gas, Water and Steam.
Chapman Valve Mfg. Co., Boston, Mass ... 41
Leng John S., 4 Fletcher, N. Y ... 56
Ludlow Valve Mfg. Co., Troy, N. Y ... 51
McNab & Harlin Mfg. Co., 56 John, N. Y ... 53

Vises.
Eagle Anvil Works, Trenton, N. J ... 51
Howard Iron Works, Buffalo, N. Y ... 55
Prentiss Vise Co., 23 Dey, N. Y ... 54

Wagon Jacks.
Millers Falls Co., 74 Chambers, N. Y ... 56

Washers.
Mason Iron Co., Philadelphia, Pa ... 2

Washing Machines.
Anthony Wayne Mfg. Co., Fort Wayne, Ind ... 31

Weather Strips.
Courtenay & Trull, 15 Dey, N. Y ... 43

Wheelbarrows.
Dreyfus J. G. & Co., 53 Park st., N. Y ... 14
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio ... 38
Prescott, H., Portsmouth, O ... 37

White Lead
Atlantic White Lead and Linseed Oil Co., 287 Pearl, N. Y ... 38
Lewis John T. & Bros., 231 S. Front, Phil ... 38
Salem Lead Co., Salem, Mass ... 15

Window Cleaners.
Bourke Sash Lock Co., Youngstown, O ... 38

Wire and Ironwork.
Barnum E. T., Detroit, Mich ... 3

Wire, *Manufacturers of*
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa ... 3
Cary & Moen, 234 W. 29th, N. Y ... 3
Hartman Steel Co., Pittsburgh, Pa ... 9
Howard & Morse, 45 Fulton, N. Y ... 2
Malin & Co., Cleveland, O ... 41
Palmer Wire Mfg. Co., Palmer, Mass ... 3
Prentiss Geo. W. & Co., Holyoke, Mass ... 2
Salem Wire Nail Co., Salem, O ... 6
Trenton Iron Co., Trenton, N. J ... 8
Washburn & Moen Mfg. Co., Worcester ... 2

Wire Cloth.
Clinton Wire Cloth Co., Clinton, Mass ... 3
Darby Edward & Sons, Philadelphia ... 3
Howard & Morse, 45 Fulton N. Y ... 2
Newark, O., Wire Cloth Co., Newark, O ... 31
Wickwire Bros., Cortland, N. Y ... 2
W. S. Tyler Wire Works Co., Cleveland ... 3

Wire Fences.
Howard & Morse, 45 Fulton, N. Y ... 2

Wire Goods, *Manufacturers of.*
Brooks M. S., Chester Conn ... 3
Darby, Edward & Sons, Philadelphia, Pa ... 3
Estey, W. S., 71 Fulton, N. Y ... 6
Gilbert & Bennett Mfg. Co., 42 Cliff, N. Y ... 3
Hollow Cable Mfg. Co., Hornellsville ... 3
Howard & Morse, 45 Fulton, N. Y ... 2
E. Jenckes Mfg. Co., Pawtucket, R. I ... 4
Ludlow-Saylor Wire Co., St. Louis, Mo ... 3
The Wire Goods Co., Worcester, Mass ... 49
Wickwire Bros., Cortland, N. Y ... 3

Wire Machinery.
Adt John & Son, New Haven, Conn ... 50

Wire Nail and Tack Machines.
Hernsheim L., 16 & 18 Exchange pla., N. Y ... 53
Sweetser, W. A., Brockton, Mass ... 51

Wire Nails.
American Tack Co., Fairhaven, Mass ... 6
HP. Nail Co., Cleveland ... 51
A. Field & Sons, Taunton, Mass ... 10
Hartman Steel Co., Pittsburgh, Pa ... 9
Illinois Wire Nail Co., Chicago, Ill ... 42
Keith & Trufant, Campello, Mass ... 43
Phillips E. & Sons, South Hanover, Mass ... 13
Plymouth Mills, Plymouth, Mass ... 2
Salem Wire Nail Co., Salem, O ... 6
The Wire Goods Co., Worcester, Mass ... 49

Wire Rods, Steel
Braddock Wire Co., Pittsburgh, Pa ... 2
Whitney A. R. & Co., 58 Hudson, N. Y ... 4

Wire Rope, Iron and Steel, *Makers.*
Broderick & Bascom, St. Louis, Mo ... 2
Hazard Mfg. Co., Wilkesbarre, Pa ... 2
A. Leschen & Sons Rope Co., St. Louis, Mo ... 2
Washburn & Moen Mfg. Co., Worcester, Mass ... 2

Wire Working Machinery.
E. J. Manville Mach. Co., Waterbury, Ct ... 37

Wood Engravers and Electrotypers.
Mugford A., Hartford, Conn ... 36

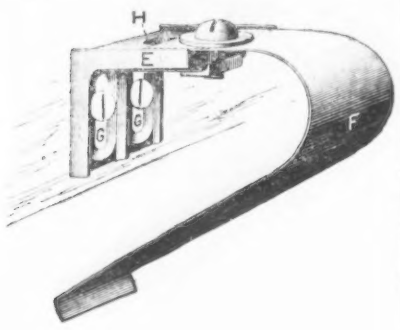
Woodenware.
Udell Woodenware Works, Indianapolis, Ind ... 49
Tucker & Dorsey Mfg. Co., Indianapolis, Ind ... 42

Wrenches, *Manufacturers of.*
Bemis & Call Hardware & Tool Co. Springfield, Mass ... 7
Coes A. G. & Co., Worcester, Mass ... 7
Coes L. & Co., Worcester, Mass ... 34
Diamond Wrench Co., Portland, Me ... 6
Marble, Geo. W., Chicago, Ill ... 7
Williams, J. H., Brooklyn, N. Y ... 49

Wringers.
Bailey Wringer Machine Co., Woonsocket, R. I ... 34
Empire Wringer Co., Auburn, N. Y ... 34
Triumph Wringer Co., Keene N. H ... 49

Duplex Door Check.

This article, which is shown in the illustration given herewith, is manufactured by the inventor, W. S. Barlow, 206 Broadway, New York, for whom William Cunningham is agent, 97 Chambers street, New York. It

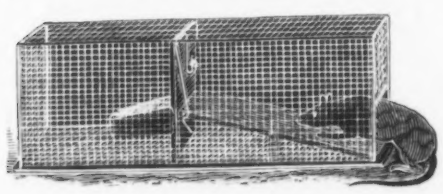


The Duplex Door Check.

is shown in the illustration fastened against the top casing of the door, the spring extending into the opening of the door. It operates, as will readily be inferred, by the door coming against the spring and forcing it up, thus permitting it to retard the motion of the door by friction. The inward end of the spring is bent downward, thus making a hook that fits into the rebate of the door frame. The double adjustment which may be given to the spring, so as to have the requisite force in controlling the door is indicated in the cut. Among the advantages to which the maker directs attention as possessed by this article may be mentioned that it stops the slamming of the door, and holds it closed without latch or catch; that it can be placed in position in a very short space of time; that it is adapted to doors of different thicknesses, and that it is not liable to break or get out of order. Its utility in preventing the rattling of car doors is also specially alluded to.

The Artful Animal Trap.

George I. Hutchings, 513 North Howard street, Baltimore, Md., is manufacturing this article, which is represented in the accompanying illustration. It will be perceived that the entrance to the trap is over a tilting table, which is held in its place until the rat or other animal touches the bait, when the table is tilted, closing the trap and giving no exit except into the inner portion of the trap. It is to be observed that while the table is tilted it is prevented from resuming

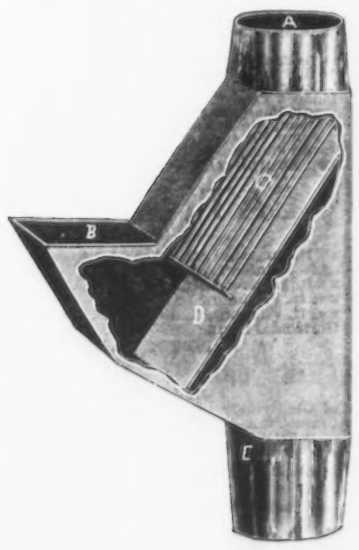


The Artful Animal Trap.

its original position by a simple contrivance which locks it down until the animal makes his escape into the inner compartment, when the locking arrangement is released and the table, which is weighted at the outer end, resumes its former position, in which operation the trap is simultaneously set for the next victim, as shown in the illustration. The end of the trap opposite the entrance is hinged and securely fastened, thus giving an opening by which the animals caught may be removed. The trap is 7 inches wide, 7 inches high and 18½ inches in length, and is made under a patent, October, 1886.

Filtering Joint for Conductor-Pipe.

Thomas Lee, of 46 and 48 Race street, Cincinnati, Ohio, is putting upon the market an article known as "Lee's Filtering Joint," which is designed to be inserted in conductor-pipes between the eaves and the cistern. The joint is in effect a filter, and serves the useful purpose of keeping the rain-water free from soot, bugs, leaves and other refuse. It is so constructed as to always be set and ready for use, and, it is claimed, not liable to clog up. It may be

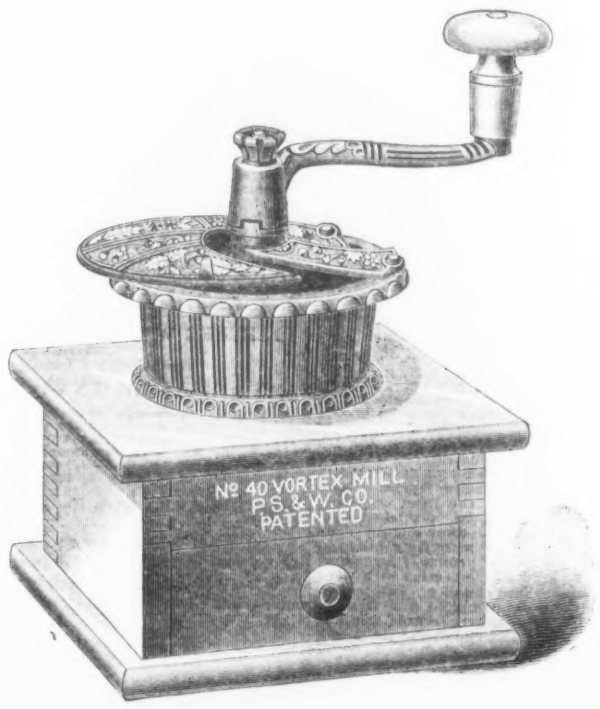


Lee's Filtering Joint.

used with or without a cut-off, as may be desired. Referring to the engraving, A represents the top or inlet; B, the hand hole, or trap, through which the filter is cleaned; C represents wire bars over the wire cloth for protection. By this means the wire cloth is saved the injury that might be caused by heavy articles dropping upon it. D is the filtering medium and consists of brass wire cloth, a material that will not rust; E represents the bottom or outlet to the cistern. We understand from the manufacturers that these filters are made of any required size. The eminent utility of the device can be seen by a moment's reflection.

Vortex Coffee Mill.

The accompanying illustration represents what is known as the Vortex Coffee Mill, brought out by the Peck, Stow & Wilcox Company, of Southington, Conn. and New York. A feature to which the makers direct particular attention is the presence of projecting lugs which serve to subdivide the aperture leading from the hopper into the grinding parts. These lugs project outward from the bottom of the hopper toward the shaft and it is claimed that they so reduce the opening as to make it impossible for the grains of coffee to feed down any more rapidly than is desirable in good grinding. The top of the hopper is closed by a tightly-fitting cover that is hinged at one side, and which in process of opening swings away in the manner indicated in the cut. In order to secure a brace for the shaft, and at the same time to provide an opening in the lid to slip around the shaft, a curved notch is provided in the lid and a correspondingly curved armpiece projecting from the edge of the hopper against the shaft. The regulation of the grinding parts is effected by means of the screw which is shown above the shank of the handle, which fits over the shaft of the mill. This is an important improvement over the old plan of having the screw below the grinding parts, making it necessary to reach inside of the drawer for such regulations as might be necessary. Coffee mills involving the features that we have here described are made by the company named in several different sizes and styles and are illustrated in their new catalogue.



The Vortex Coffee Mill.

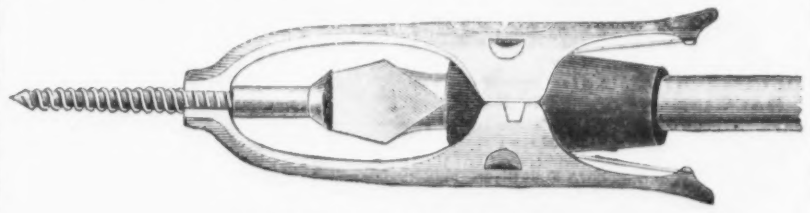
Domestic Steam Washer.

Losher & Donoghue, 14 Bolivar street, Cleveland, Ohio, are manufacturing what they call the Domestic Steam Washer, under the patentee's license. The accompanying engraving shows the general appearance of the device. It measures 12 x 22 inches at the bottom, and the inclosed revolving cylinder for holding the articles to be washed is 10 inches wide and about 18½ inches in diameter. The cylinder is constructed without a central shaft or axis, being sustained by outside attachments. Acordingly, there is no obstruction in the way of a large quantity of material. The outside case or boiler is made of galvanized iron, and, as indicated by the engraving, is slightly tapering, being smaller at the top than at the bottom. The cylinder or boiler cover is made of XX tin, and the bolts and fittings are either tinned or japanned. The device is handsome in general appearance, and is so stenciled as to be attractive in a store. From the sample which we have examined it appears to be well made in every particular. It is adapted for use on stoves of different kinds, including coal and wood, and also on stoves burning oil and gasoline. One of the cuts which the makers put forth shows the device mounted on a parlor heating stove. Among the advantages claimed for it is that it takes up no more room on a stove than a wash-boiler, and yet it will do much which a wash-boiler can not do. The cylinder is perforated at certain intervals to allow the entrance of steam to clean the clothes. It is claimed that the most delicate laces and cambrics, as well as the heaviest quilts and blankets, not even excepting carpets, may be thoroughly cleansed in this device without the use of the washboard. It is asserted further that it does thoroughly and easily in 60 minutes of washing what would take a day to do otherwise. The action of the washing machine depends upon the purifying properties of steam, which, in this device, are put to practical account. It is asserted that while other machines churn the clothes in dirty water, this keeps them above the water, allowing pure steam to permeate every part of the fabrics in the cylinder. The water of condensation dissolves the dirt, and carries it away from the clothes as it drips back into the outer box. In a letter from the makers, they refer to the interest which this machine possesses for the general trade as a good selling article. A circular has been prepared giving very explicit directions for the use of the machine.

Domestic Steam Washer.

The Unique Screw-Holding Screw-Driver.

This article is manufactured by Wallen & Nesbitt, for whom the Alford & Berkele Company are sole agents, 77 Chambers street, New York. It is made under Wallen's patent. The illustration is full size and represents the special features of the tool. It will be observed that on the blade of the screw-driver there is a sliding clutch, the object of which is to hold the screw steadily in place while it is being inserted, the screw-driver revolving freely, and the screw thus conveniently turned in. It will be perceived that this clutch is easily opened so as to permit the screw to be readily put in place and also permitting the removal of the clutch when the screw is nearly driven home. The convenience of this device in inserting screws without the aid of a gimlet, and in inaccessible places, will be appreciated. It is obvious that the clutch can easily be disengaged from the screw and run back on the blade toward the handles, when the screw-driver can be used in the ordinary way if desired. The blades of this screw-driver are described as made of cast steel, carefully tempered, the handle being securely fastened to the blade by means of a screw through the tang, so that the handle cannot get loose or the blade pull out. The blades are six inches in length, the entire length of blade and handle being 10 inches. Information in regard to the prices is given in the Trade Report.



The Unique Screw-Holding Screw-Driver.

The Buckell Safety Clevis.

This article is manufactured by J. B. Whitfield, Pontiac, Mich. It is illustrated in the cuts herewith given, which illustrate the special feature of its construction. From these illustrations it will be observed that the clevis pin is held in place by means of a

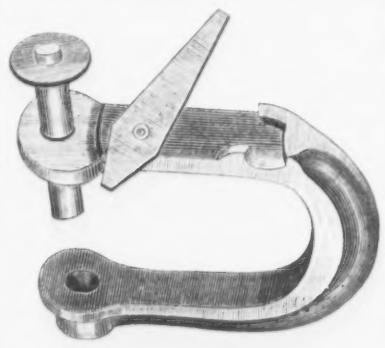


Fig. 1.—Clevis with Drawn Pin.

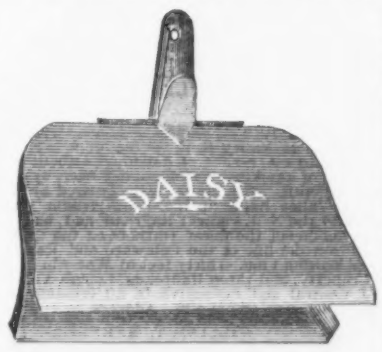
steel spring, the operation of which is shown, Fig. 1 indicating the position of the spring for the removal of the pin, and Fig. 2 showing the clevis with the pin held in place by the spring. These clevises are made of malleable iron, and of different sizes and for various purposes. The points which are made in their favor are that they are smooth on both the upper and lower sides; that the the clevis pins cannot catch on an object,

Fig. 2.—Swivel Clevis Ready for Use.

cannot fall out, and are not liable to rust in; that they are quickly and easily changed; that they can be used as a ring if needed, as they work as safely and satisfactorily upside down as otherwise; that the springs are made of oil-tempered steel, but may be made of brass if desired, and will stand all that is required of them, as they are in no way exposed nor subjected to any strain, and that the clevises are thoroughly tested, durable and saleable. The manufacturer is the owner of the right for the United States, and desires to make arrangements with other parties for their manufacture in different parts of the country.

The Daisy Dust Pan.

The accompanying illustration represents an improved dust pan, which is being offered to the trade by R. E. Foster, of Milford, Mass. The dust pan shown is the invention, we are informed, of Mrs. Lydia D. Foster, the wife of the gentleman above named, and is, therefore, presumably an article in which housewives generally will feel an interest on account of its practical usefulness. The improvement consists in hinging a cover to the back of the pan, which is so shaped as to shut down closely upon the contents of the pan after a sweeping has been put in it, and thus avoid the danger of the dust and lint being blown about the room, or the dirt spilled off by careless handling. The top of the cover is provided with a lever which comes under the thumb in holding the handle of the dust pan, and which is adapted for raising the lid and holding it in that position for the purpose of receiving the dirt. The dust pan itself is of the conventional corrugated pat

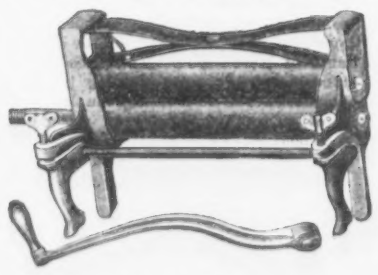


The Daisy Dust Pan.

tern, and the sample before us is finished in green, with the name Daisy stenciled in bronze.

The Triumph Toy Clothes Wringer.

The Triumph Wringer Company, Keene, N. H., are manufacturing a malleable iron toy wringer, which is represented in the



The Triumph Toy Clothes Wringer.

accompanying illustration. The frame is of malleable iron tinned, and the pressure on the rolls is by means of tempered springs of the form shown. The rolls are solid rubber 3¼ inches long. The clamping attachment is by thumb nuts, which operate in the manner indicated in the cut. The wringer is neatly made, and while intended as a toy is referred to by the manufacturers as capable of wringing small articles, such as handkerchiefs, lace collars, &c. The reasonable price at which it is put on the market is also alluded to.

The Mines of the Kingston and Pembroke Company.

Numerous references have been made lately to an enterprise in the hands of American capitalists chiefly to develop mines in Canada. The following official statement of the property of the Kingston and Pembroke Mining Company will be of interest in this connection.

This company were organized at Kingston, Ontario, Canada, under the laws of Canada, on the 17th ult. The capital stock of the company is $5,000,000. The officers are: President, Henry Siebert, New York; vice president, B. W. Folger, Kingston; secretary and treasurer, D. L. Gibbens; directors: H. H. Hollister, F. S. Flower, D. L. Gibbens, H. Siebert, W. E. Cooper, Gen. Samuel Thomas, R. Stirling, B. W. Folger, W. G. Pollock.

The company own and have rights on 8000 acres of iron mining lands extending for 60 miles along the Kingston and Pembroke Railroad. They have 13 distinct mining properties, which are being worked more or less, and are known as: 1. The Zanesville Glandower property, owned in fee simple, comprises 650 acres, from which 10,000 tons of ore have been sold; has $20,000 worth of machinery. There are three openings on this vein, covering a distance of ½ mile. A large amount of ore, estimated by a conservative engineer to be 50,000 tons, is in sight in the main shaft. 2. The Grady-Machar mine, owned in fee simple, and comprises 100 acres, upon which there is $2000 worth of machinery. 3. The Levant mine, comprising 450 acres, which is leased for 99 years at a royalty of 15 cents per ton. There are three shafts on this property, from which some 60,000 tons of ore have already been taken. This property contains the celebrated Wilbur mine, which produces ore lower in phosphorus than any Bessemer ore imported into the United States. There is $40,000 worth of machinery on this property. 4. The Lalonde mine, 100 acres in fee, upon which there is $2000 worth of new and improved machinery. 5. The Culhane mine, 100 acres in fee and $2000 in machinery. 6. The Williams mine, 100 acres in fee, and $5000 worth of machinery. 7. The Calabogie mine. This property is leased at a royalty of 15 cents per ton on ore sold; $15,000 worth of machinery. 8. The "Blue" ore lot, 100 acres in fee. 9. The Mississippi mine, covers one square mile, and is leased for 99 years at a royalty of 15 cents per ton on ore mined and sold. There have been 150,000 tons of ore taken from this mine thus far. The plant cost $20,000. 10. The Gildersleeve mines, comprises 1266 acres in fee and 300 acres in rights. This property contains the celebrated "Flower" mine, which is considered to be the largest mine ever found in Canada. 11. The company own options on some 2600 acres of mining lands in the township of Palmerston, Sherbrooke, Bathurst, Oso and Alden, costing already some $10,000, and which can be taken up at a cost of some $26,000 for the lot or $1000 for 100 acres. 12. The "Red Ore" lot, 100 acres in fee. 13. The Black Lake lot, 100 acres in fee.

The ore produced from the above enumerated properties is of the highest grade, running as pure as 60 per cent. of iron, with but the slightest trace of sulphur, thus making it the easiest kind of ore for smelting, and is already, although but shortly in the market, in active demand among the leading iron foundries in Cleveland and Chicago, to whom 200 tons per day is being shipped. The output of the mines, without additional expense for machinery, can be increased to 1000 tons per day, for which a ready market can always be found both in the United States and Canada. The management of the company is in the hands of conservative men, who will do all in their power to thoroughly develop this valuable property, and place it upon an honest dividend-paying basis. The company have a working capital of $200,000 cash in their treasury.

The International Railway Exposition at Paris.—Mr. John W. Weston, of Chicago, Commissioner General for the United States in connection with the international exposition of railway appliances and industries to be held in Paris this year, has sent us the following letter, dated May 23: "I am requested by the Executive Committee in Paris to ask the favor of appealing through your columns for the loan of any objects, books, medals, drawings, &c., relating to the history of railways and means of transportation generally, both ancient and modern, in this country. I am directed also to say that all expenses of forwarding and returning the same to the lenders, packing and unpacking, will be defrayed by the Executive, and insured for the value the lender may put upon each object, and that special attendants will be told off for their safe custody. All communications on the subject may be addressed to M. G. Senechal, 8 Faubourg Montmartre, Paris, or to Mr. Geo. L. Fowler, M. E. (of New York City), Commissioner in charge for the United States, Palais de l' Exposition, Bois de Vincennes, Paris, France. By addressing communications direct to Paris much valuable time will be saved."

A large gas well was struck on the 20th ult., within eight miles south of Toledo, Ohio. The depth of the well is 1,235 feet, and the flow of gas is reported to be large. On the same day the third gas well was struck at Massillon, conclusively proving that that locality possesses an abundant supply of this cheap fuel.

It has already been announced that the Baltimore and Ohio passenger stock is to be equipped with the Westinghouse brake. The latest form of quick-acting triple valve, first used at the Burlington trials, will be applied for the first time in regular service.

Special Notices.

BUSINESS OPPORTUNITIES.

To Manufacturers.

BELOIT, WISCONSIN.

A beautiful city of 6000 inhabitants, located in the Rock River Valley, within three hours' ride to Chicago and Milwaukee, over competing railway lines, offers large inducements to manufacturers. Close proximity to hard and soft lumber, iron mines and furnaces; cheap coal; unsurpassed facilities for receiving and shipping by rail; lowest freight rates; no switch charges; superb water power; cheap homes; college, schools, churches, and all social advantages; intelligent and contented labor, male and female; best climate in the world to work in; gas and electric light; water-works sufficient for 50,000 population. For particulars address,

J. B. DOW, Sec'y,
BELOIT BUSINESS MEN'S ASSOCIATION,
Beloit, Wis.

FOR SALE, CHEAP—Small Manufacturing Site on Rock River, Beloit, Wis., frame building, 50 x 60; 200 inches water, about 20 horse power, water wheel and jack. Price, $3000. Address
J. B. DOW, Beloit, Wisconsin.

IN ORDER to give exclusive attention to and extend its manufacturing facilities for which its present location does not give required room, a company long established and admirably located in a western city, at present engaged in Manufacturing and Jobbing Plumbers', Gas Fitters' and Steam Fitters' supplies, will dispose of at favorable figures its leasehold and stock of goods and material held as dealers or jobbers of such goods, with all unfilled or accepted orders for same, existing at date of disposal. Provision for the latter, if of such material as this company proposes to manufacture, can be made at prices and on terms satisfactory to the purchaser if so desired. A continuance of the business without interruption and disappointment to the trade being this company's wish. Purchasers can take immediate possession of a paying business, with a trade secured. Business established 22 years; size of building, 44 x 110 inside; five floors with light on three sides; every floor available for use; entire building warmed by steam; offices large, convenient and well lighted; large brick vaults on ground, second and third floors, and entire building lighted by electricity and gas. Such permanent fixtures as Boilers, Engine, Heating and Lighting Apparatus, Power Elevators, &c., or any part of same, will be included in sale if desired. Present trade chiefly in New York, Pennsylvania, Ohio, Indiana, Michigan and Canada, with large retail trade in the immediate vicinity. Satisfactory terms of payment with reliable purchasers, and information of past and present business needed for its continuance fully and freely given. Address, in person or by letter,

WORSWICK MFG. CO.,
Cleveland, Ohio.

April 2, 1887.

FOR SALE,
for best of reasons,

A CLEAN STOCK OF LIGHT AND SHELF HARDWARE

and Sporting Goods that will invoice about $6000. The finest store front and fitted up room of the kind in a city with a population of 45,000 and is one the largest manufacturing and railroad centers in State of Pennsylvania. Is and always has been doing a paying business and now enjoys the most lucrative trade in Builders' Hardware, Carpenters' Tools and Sporting Goods in the city. An exceptional opportunity for a young man. In the employ of the store is the best liked hardware clerk in the city, hard worker, competent to run the business, thoroughly honest, kind in manner, in best of repute with the contractors, and working for a moderate salary.

Address "REASON,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

ATTENTION,
Capitalist - and - Foundryman.

An Incorporated Company offers for sale State Rights to manufacture, and sell a valuable Patent Boiler (for house-heating). Hundreds in successful operation, which can be referred to for full particulars.

Address Box 1006,
WORCESTER, MASS.

New England States reserved.

FOR SALE.—Stock of Iron, Steel, Wagon and Carriage material, both Iron and Wood; also, large, convenient Store Room, located in growing manufacturing and now booming city of Quincy, Ill., the second city in the state, population about 40,000; quite a railroad centre and on the great Mississippi River. Excellent traveling territory on every side; for fine, rich country scarcely equaled. Business established twenty years. Money made every year. The only store of the kind in the city. Reason for retiring, bad health.

LEMLEY BROTHERS,
Quincy, Illinois.

FOR SALE, to close an estate,

A HARDWARE STOCK

of $15,000 in the best business city in Michigan. Business established twenty-five years. Address "HARDWARE STOCK,"
Office of *The Iron Age*, 66 and 68 Duane St., New York

FOR RENT.

VALLEY FORGE MILL AND WATER-POWER,

(Belonging to Estate of Charles H. Rogers, dec'd.) Situated at Valley Forge, Pa., on the Phila. and Reading Railroad, 23 miles from Phila. The buildings consist of a four-story stone Mill, L shaped, with tin roof, 28 stone Tenant Houses and stone Dry and Dye House. The water-power is known as one of the best in the state. The property was occupied for many years as a Woolen and Cotton Manufactory, but is adapted to general manufacturing purposes.

For particulars, address
J. B. CARTER, Hardware Manfg. Agt.,
504 Commerce St., Philadelphia.

FOR SALE.

A GOOD CLEAN HARDWARE STOCK.

in a town of four thousand inhabitants in Southern Dakota; annual sales, $15,000. This is a rare chance and will bear investigation. Cause of selling, death in family. Address
"LOCK BOX 173,"
Mitchell, Dak.

ADDITIONAL CAPITAL WANTED.

A party with $2,000 or $3,000 capital to take an active interest in a well-known

AGRICULTURAL IMPLEMENT BUSINESS,

in one of the largest and most prosperous cities in Tennessee. Full and thorough investigation is requested. References given and required. Address "BOX K,"
Chattanooga, Tenn.

Special Notices.

BUSINESS OPPORTUNITIES.

FOR SALE.

THE MELVIN SEWING MACHINE CO.'S FACTORY AND GROUNDS,

located in Chillicothe, Ross Co., Ohio, and adjoining the depot grounds of the C. W. & B. and Scioto Valley Railroads. The main building is of brick, 133 x 33 feet; three stories, slate roof, well lighted and floors 6 in. thick. The Engine, Boiler and Japan rooms and Blacksmith shop are all of brick and covered with tin. The whole building heated by steam and lighted by electricity. It contains a 45 horse-power Reynolds-Corliss Engine, a 75 horse-power Babcock & Wilcox Boiler and Edison Dynamo, all in good condition. One house and lot and three vacant lots, all adjoining the factory grounds. This is a desirable property for manufacturing purposes, and will be sold at a bargain. For further particulars call on or address

NELSON PURDUM, Receiver,
Chillicothe, Ohio.

FORT SCOTT, KANSAS.

Attention of Capitalists and Manufacturers is called to the numerous advantages existing at Fort Scott, Kansas, which will soon make this city one of the most important manufacturing and commercial points in the West, and enable it to maintain its present supremacy over all other cities in this State. The natural facilities are unequaled. Coal of the best quality is sold at $1.50 to $2.00 per ton; slack, 50 cents to $1 per ton, delivered. Abundance of stone and brick, best quality. Natural gas is fully developed and used for all purposes. Facilities for transportation and distribution are unequaled, being already the junction of five trunk railways. Direct communication with lumber regions of Missouri and Arkansas. Correspondence solicited.

SECRETARY BOARD OF TRADE.

BESSEMER STEEL COMPANY, Ltd.,
Office, 218 S. Fourth St.,

PHILADELPHIA, December 1, 1886.

A demand for steel blooming mills of small size having arisen, we have decided to grant licenses for movable feed tables having driven feed rollers under the George Fritz patent, No. 133,771, dated December 10th, 1872, hereafter, with reference to the product of the mill.

Licenses will therefore be granted under the said patent for mills hereafter erected and put into use upon the payment of $1000 down and a royalty of ten cents per ton for all metal rolled thereon in excess of 50,000 tons in any year.

These terms are extended only to mills hereafter erected by persons procuring licenses before said mills are put into use.

All infringers of this patent will be vigorously prosecuted.

JOHN M. KENNEDY, Secretary.

Notice! Manufacturers and Capitalists!!

The coal regions of Pennsylvania are attracting manufacturers generally, and your special attention is called to Pleasant Valley, near Scranton, Pa., which presents superior advantages. Location central. Eligible sites. Cheap fuel. Water abundant. Special inducements to any who will locate. Railway facilities unsurpassed. Four of the largest railway systems of the Middle States centering here. Particulars on application to

THE BOARD OF TRADE,
Avoca P. O., Pa.

Hon. G. B. SEAMAN, President.

FOR SALE.

THE OLD COLONY IRON CO., of Taunton, Mass., offer for sale their

ROLLING MILL, NAIL FACTORY, MACHINE SHOP, FOUNDRY, COOPER SHOP, LANDS AND TENEMENTS,

situated in the town of Somerset, on the Taunton River, 4 miles above Fall River. Said Mill contains 7 Double Puddling Furnaces, 1 Scrap Furnace and 4 Heating Furnaces, with Squeezers, Rolls, and all the necessary apparatus for converting the product of said furnace into nail plates. The Nail Factory contains 81 Nail Machines, with a capacity of cutting all the plates the mill rolls.

The above property is situated on a wharf where vessels drawing 18 feet of water can discharge coal and iron directly to the mill.

They also offer for sale their Tack Plate Rolling Mill, Shovel Shop, Water Privilege, Land and Tenements situated at East Taunton, Mass. For further particulars, address

O. A. WASHBURN, Jr., Treas.,
Providence, R. I.

FOR SALE OR TO LEASE.

at Perth Amboy, New Jersey, adjoining wharves of the Lehigh Valley R. R. (30 feet of water, admitting largest ocean steamships without obstruction of any kind), 1200 feet dock front by 4000 feet in depth. This property is crossed by the Lehigh Valley Railroad, the Pennsylvania Railroad and the N. J. Central Railroad, and, besides being on one of the finest Harbors on the Coast, is also on the line of the Delaware and Raritan Canal Towing Line. Thirty feet of Water in front of property, and three Railroads, Lehigh Valley, N. J. Central and Pennsylvania, all crossing the tract. See map on page 49. Address

WILLIAM T. MEREDITH,
No. 48 Wall St., New York.

Alabama's Mineral Belt.

Parties wishing information about, or investment in, Alabama Mineral, Lumber or Agricultural lands, will please address, with stamp,

EDWARDS & ARNOLD,
Talladega, Ala.

WANTED, MANUFACTURING INDUSTRIES to locate at

CRESSONA, SCHUYLKILL CO., PA.

In close proximity to anthracite coal fields; gas and water throughout the town; healthy climate; abundance of labor; competing railroads; special inducements to parties meaning business; advantageous offer to those engaged in the manufacture of stoves or agricultural implements. Correspondence solicited. Address

"E. R. M.,"
Box 12, Cressona, Schuylkill Co., Pa.

HARDWARE BUSINESS.

Wanted, a partner to assist in buying out an old and well established Hardware Store, doing a business of about $100,000. Situated in one of the largest and most flourishing cities in New England. Address

"NEW ENGLAND,"
Office of *The Iron Age*, 66-68 Duane St., New York.

FOR SALE,
in whole or in part,
THE COLUMBUS MALLEABLE IRON WORKS.
Address ZELOTES, WOOD & CO.,
Columbus, Ohio.

Special Notices.

BUSINESS OPPORTUNITIES.

MUNCIE, INDIANA,

is surely blessed by nature, and destined to become one of the great manufacturing cities of the West. It is already acknowledged by experts to be equal, if not superior, to Findlay, Ohio, as a natural gas-field. Its shipping facilities are unsurpassed for local and through rates East, West, North and South. It has all the modern improvements of the largest cities—Water and Gas Works, Edison Incandescent and Brush Electric lights. Its healthy and beautiful location makes it a desirable home. Warren, Jones & Gratz have removed their immense Bagging Factory from Brooklyn, N. Y., to Muncie, and several other manufacturers in Glass, Iron and Wood are negotiating with the Board of Trade and private citizens for the same purpose. Its inhabitants are energetic, and famous for their liberality and sociability, and will cordially welcome all industrious people who will join them in their progressive march. All information desired can be had by addressing

SECRETARY BOARD OF TRADE,
MUNCIE, IND.

PUBLIC SALE
—OF—
Valuable Engine and Machine Shops and Foundry at Columbia, S. C.

For the purpose of settling the affairs of the late firm of Tozer & Dial, both partners having died, the undersigned will sell under the orders of Court to the highest bidder on Monday, the 6th day of June, 1887, in Columbia, S. C., the very valuable Engine and Machine Shops and Foundry known as the Tozer & Dial Engine Works. These shops are fitted with all of the most improved Machinery, Tools, Shafting, &c. propelled by a 25 horse-power and a 6 horse-power Engine. The buildings are new, of brick with tin roofs, and cover more than an acre of ground. A railroad track runs into the grounds connecting with all of the railroads running into the city. This establishment is one the most complete and well-appointed plants in the Southern States and has commanded a very wide, extended and profitable patronage. Terms, one-third cash, balance in in two equal annual instalments.

For further particulars, apply to the undersigned,

Columbia, S. C., JOHN T. SEIBELS,
12th May, '87. Master for Richland Co., S. C.

FOR SALE—The Property known as

THE CLARK MFG. CO.,

Buffalo, N. Y., being 135 feet on Niagara Street, running through to Seventh Street 264 feet, three-story brick building with basement, 60 x 60 feet; Brick Foundry, 100 x 135 feet; Large McKenzie Cupola and Blower; also Small Cupola and Blower; three Brass Melting Furnaces; one Harris Corliss Engine, 50 H. P.; one Babcock & Wilcox Safety Boiler, 75 H.-P.; one Platform Fairbanks Scales; Line, Shafting, and Pulleys; all in complete order. Address

JAMES E. FORD, Assignee,
Buffalo, N. Y.

TACK FACTORY FOR SALE.

The Tack Factory situated in Taunton, Mass., lately occupied by Lewis A. Rounds, deceased, under the name of the Sparta Tack Co. The mill is thoroughly fitted to carry on the business in all departments, with a lease of the building. Among the machinery are twenty-nine Reed and Blanchard machines, fifteen wire nail and tack machines, long emery grinder, sets of grindstones, bluing and pickling apparatus, &c., &c. Everything is in first-class order for carrying on the business, with good line of trade established. Will be sold low for cash. For further particulars inquire of

ALMEDA P. ROUNDS, Admx., or
H. J. FULLER, Attorney.

VALUABLE IRON MINE FOR SALE.

This property covers an area of 3 0 acres and exhibits at various points an Ore giving 66 per cent of Iron—furnace best—no sulphur or phosphorus. The property is situated within 10 miles of Ottawa and is most favorably placed for mining operations. The highest reports upon the property have been received from first-class experts. Title perfect. The new Canadian Iron tariff makes this a most valuable property. Samples of the Ore and further particulars can be obtained by applying to the Manager—Ontario Bank Ottawa, Canada.

Excellent Magnetic Iron Ore Tract,

Evidencing well for quantity and quality; neighboring large and successful working mine, and but three hours' ride distant; will be leased to faithful worker favorably.

CO-OPERATIVE,
P. O. Box 1879, New York.

FIFTY SHARES OF STOCK

IN MANUFACTURING COMPANY

for sale very low. To purchaser of the right sort, the sale of the product will be arranged for.

Address "P. O. BOX 1423," New York.

FOR SALE.

OVER 5,000 ACRES OF LAND,

Containing millions of tons of Coal, Iron Ore and Limestone. Pig Iron can be made at less than $9.00 per ton. The property is connected with the Cincinnati, Washington & Baltimore Railway.

H. R. KNOTWELL, Agent,
Lewistown, Mifflin County, Pa.

HARDWARE BUSINESS WANTED
in exchange for
FLORIDA FARM PROPERTY;
beautiful lake front; orange grove; lumber mill; location, healthy and accessible. Address

N. A. VURGASON, Lake Como, Florida.

PATENT FOR SALE.

REICHERT'S PATENT ROTARY SLICER, good for 14 years for sale cheap with medal. Adapted for grocers, sauerkraut dealers, &c. Party selling unable to manufacture. Used in the leading hotels of New York. Apply

HENRY DEGENER, 435 First Avenue,
New York City.

A PATENT FOR SALE.

A Ratchet and Stationary Combined

MONKEY WRENCH.

A Rare Chance for manufacturers. It has been thoroughly tested, and I am unable to fill orders on assorted sizes for the want of capital to manufacture. Best of reference given on application. Address B. F. STOCKFORD, South Bend, Ind.

Special Notices.

BUSINESS OPPORTUNITIES.

FOR SALE.

THE MACHINE SHOP AND FOUNDRY

with six acres of land, now occupied by

THE STILES & PARKER PRESS CO.,

situated in the city of Middletown, on the Connecticut Valley Railroad. This is the only Jobbing Machine Shop and Foundry on the Connecticut, between Hartford and the Sound, and has the patronage of most of the surrounding towns; possessing good facilities for freighting by the Connecticut River and three railroads. Proposing to remove our business from the city, we will sell this property at a reasonable price, and part payment may be made in castings. Possession given about October 1st. Apply on the premises, or by letter to

N. C. STILES, Treasurer.

WESTERN STOVE FOUNDRY
FOR SALE

One of the finest opportunities ever offered to parties wishing to interest themselves in this line of business.

Will sell stock on hand, Patterns, Follow-boards, &c., with an already well-established, paying business. Foundry has been in operation the past 12 years; has a number one, well organized force and steadily growing trade.

Is located in one of the livlest towns in the West; will take about $40,000 to handle.

This is no old, played out plant but a wide-awake institution in a wide-awake country.

Parties meaning business address

"WESTERN MANUFACTURER,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

PARTNER WANTED.

The Advertiser, having a

VALUABLE INVENTION,

much needed on locomotives and all kinds of engines and compressors, wishes to find a partner or partners with capital to introduce it. Parties established in business or with influence among such people preferred. Address "PARTNER," Box 44, Office of *The Iron Age*, 66 and 68 Duane St., for full information.

HARDWARE STOCK FOR SALE

in best retail town in Iowa; inventories about $9500; 7000 inhabitants; three Hardware stores; C. & N. W. R.R. shops located here; large coal-mine trade. For terms of sale and further particulars, write to

E. P. HOUSE, Agent, Boone, Iowa.

MANUFACTURERS wanting their goods

REPRESENTED IN CANADA

please address J. D. ANDERSON, Jr.,
P. O. Box 15, Montreal Canada.

WANTED.

Responsible Parties with $75,000 can find PROFITABLE INVESTMENT for that sum, by forming with a reputable firm having over 20 years' experience, an incorporated Company to purchase one of the best-equipped Merchant Rolling Mill and Manufacturing Plants in the country, location first class; Coal and Iron at hand in abundance and shipping facilities both by rail and water routes unsurpassed. Address in strict confidence, N. HARPER,
Office of *The Iron Age*, 4th & Main Sts., Cincinnati, O.

WE BUY
all kinds of
IRON AND STEEL SCRAP, BURNT IRON, OLD RAILS AND CAST BORINGS
(in carloads *only*). Write us, naming quantity and price.

ROBINSON & ORR,
115 Water St., Pittsburgh, Pa
(ESTABLISHED 1859.)

NOTICE.

We buy and sell all classes of Iron and Steel Scrap. Correspondence solicited.

JOS. C. POULTERER & CO.,
216 S. Fourth St., Philadelphia

WANTED.

IRON AND STEEL SCRAP.

Address
VALENTINE & ARMSTRONG,
226 S. Fourth st., Philadelphia, Pa.

IMPORTANT.

Wanted *Cast Wrought Iron* and *Steel* Turnings.
Address, THOMPSON C. GILL & CO.,
Dealer in Iron and Steel of all kinds,
210 South 3d Street, Philadelphia, Pa.

Cars for Sale.

The Iron-Work of fifty Ore Cars. Standard gauge 30-inch wheels; 4¾ tread; 4-inch iron axles.
All in good condition, and in lots to suit.

THOMPSON C. GILL & CO.,
210 South Third Street,
Philadelphia, Pa

SPECIAL NOTICE.

We have constantly on hand large lots of OLD IRON and METALS to be sold cheap. Send for quotations,

PETTIS & HIGGINS,
301 Fountain St., Providence, R. I

WE WANT

No. 1 Wrought Scrap Iron; Wrought Iron Turnings; Steel Turnings; Cast-Iron Borings; Burnt Iron, &c.

JOS. J. LIPPINCOTT & CO.,
341 Walnut St., Philadelphia

WANTED,

Iron and Steel Scrap.

We buy all kinds of Iron and Steel Scrap
Write to us when you have any to sell.
SITES, WHEELER & CO.,
222 and 224 So. Third Street,
Philadelphia, Pa

EXCELLENT BLACK COPIES of *anything written* or *drawn* with *any* Pen (or Type Writer) by the Patent
AUTOCOPYIST Only equaled by Lithography. Specimens free.
AUTOCOPYIST CO., 166 William St., New York

TO SELL AT A BARGAIN, ten miles of 37-lb. Steel Rail with chain fastenings, in excellent condition, and new spikes for same. Address
T. H. McGOWAN & CO.,
Portsmouth, Mich.

Special Notices.

MACHINERY.

BARGAINS.

4	5 x 6	Vertical Engines, New		$75
1	5 x 8	"	"	125
1	6 x 6	"	"	85
1	6 x 8	"	"	140
1	7 x 8	"	"	155
2	8 x 9	"	"	165
1	8 x 10	"	"	210
1	24 x 4	Boiler,	"	77
1	24 x 5	"	"	88
1	24 x 6	"	Second hand	65
1	26 x 5	"	"	75
1	28 x 6	"	"	85
2	30 x 5	"	New	118
2	30 x 6	"	"	122
2	30 x 7	"	"	157
2	36 x 7	"	"	187
1	36 x 8	"	"	198
1	42 x 9	"	"	295
1	4 Horse	"	Engine and Boiler, Second hand	85
1	5	"	"	175
1	6	"	Horizontal Engine "	125
2	10 x 12	"	" New	200
1	10 x 14	"	" "	225
1	15 Horse	Portable Engine on skids, Second hand		300
1	8	" Boiler	"	110
1	18 in. x 6 ft.	Ser. w Cutting Lathe, New		250
1	18 in. x 8 ft.	" " "	"	262
1	16 in. x 6 in.	" " "	"	175
1	12 in. x 5 in.	" " " Bement	"	85
1	Axle Lathe	" "	"	100
1	30 Horse Vertical Boiler and 15 Horse Vertical Engine			350
1	Crank and Fly Wheel Steam Pump, 5 in. suction			175

Write for prices and mention what you want if not named.

LOVEGROVE & CO.,
143 & 145 N. Third St. Philadelphia, Pa.

EQUIPMENT OF

MACHINE
—AND—
Railway Shops.

My propositions cover Engines, Boilers, Cold Rolled Iron or Steel Shafting, Adjustable Self-Oiling Hangers, Compression Couplings, Split or Solid Pulleys, Iron and Wood-Working Machinery, Foundation Drawings. Everything delivered at the shops to be equipped, located, started, not to be accepted or paid for until running satisfactorily. In this way only can parties purchasing know in advance just what the entire cost will be and keep out bills for "extras," which are usually numerous at the end of such jobs.

I have in this way equipped many railway and car shops, and I know of no instance in which entire satisfaction has not been given. Terms of payment made satisfactory.

Eastern Agent J. A. FAY & CO., Cincinnati.

GEORGE PLACE,

Late the Geo. Place Mach. Co.,

121 CHAMBERS STREET, NEW YORK.

For Sale, Cheap.

Condensing Beam Engine, 42-in. Cylinder, 7-ft. stroke, in good order.
One pair heavy Alligator Shears, 32-in. cutters, for old rail or plate.
Two pair lighter Alligator Shears, one with Engine attached.
One No. 37 Sturtevant Blower, in good order.
Floor Plates, assorted sizes.
Straightening Plates.
Ten sets of Boiler Castings.
Lot of Wrought and Cast Iron Pipe, some large sizes.
One-hundred Tons, more or less, Wrought Iron Scrap.
Two hundred Tons Cast Scrap, Rolls, Housings, Gearing &c. Address

BIRMINGHAM IRON FOUNDRY,
Birmingham, Conn.

SECOND HAND,
CHEAP.

1 Planer, Planes 18 ft. x 42 in. x 42 in., Putnam make.
1 Planer, Planes 11 ft. x 44 in. wide.
1 7-ft. 28 in. x 28 in. Planer.
1 20-ft. bed, 28 in. Putnam Lathe.
1 8-ft. bed, 18-in. Engine Lathe.
1 10-ft. bed, 17-in. Engine Lathe.
1 No. 4 Screw Machine, Jones & Lawson.
1 Hand Milling Machine.
1 Profiling Machine, 2 spindles.
2 36-in. Back Gear Self-Feeding Drills.
1 25-in. Plain Drill 14-in. x 14-in.
1 4-spindle Garvin Drill.
1 Bolt Cutter, Cuts ¾-in. to 1-in. Bolts.
Send for List of Second hand Tools.

New York Machinery Depot,

Bridge Store No. 16, on Frankfort st., New York.

BARGAINS IN ENGINES
WE HAVE TAKEN IN EXCHANGE.

Two Corliss Beam Engines, 400 and 600 H. P.
22 x 36 Slide Valve Engine; good as new.
24 x 48 Wright Engine.
17 x 42 Slide Valve Engine.
16 x 36 " " "
14 x 30 Loomis Automatic Cut-Off Engine.
9 x 21 Horizontal Todd & Rafferty "
9 x 18 " Slide Valve Engine.
9 x 16 " " " "
7½ x 10 Vertical Engine
Cheap 10 H.-P. Root Trunk Engine
30 H.-P. Vertical Boiler.
Blake Pump, 8 x 8 x 12.
Worthington Pump, 12 x 7 x 10.
Cameron Pump, No. 2.
Niagara Pump, No. 4.
Woodward Pump, No. 3.

DEXTER ENGINE CO., 40 Cortlandt st., New York.

LATHES.

14 in. x 5 ft. Putnam Lathe.
17 in. x 7 ft. Putnam Lathe.
24 in. x 8 ft. Putnam Lathe.
20 in. x 22 ft. Fitchburg Lathe.
24 in. x 24 ft. Fitchburg Lathe.
48 in. Horizontal Boring Mill.

A. B. PITKIN, Providence, R. I.

FOR SALE, CHEAP.

Lot of Old Cylinder Boilers, suitable for smoke stacks, tanks, flues, forges, &c.

MERWIN McKAIG, Cumberland, Md.

FOR SALE, CHEAP.

One (1) No. 2 Merriman Bolt Cutter, to cut ¾ to 1½ in., with Taps, Dies, Countershaft, Pulleys, Pots, &c. Complete, perfect, new, and has never been used; made by H. B. Brown & Co.

BEECHER & PECK,
New Haven, Conn.

FOR SALE,

1 20-in. Swing, 12-ft. Bed Screw Cutting Engine Lathe, new; 1 1½-in. Merriman Bolt Cutter, new; Fine Machinery Castings, heavy and light.

THE McLAGON FOUNDRY CO.,
26 and 30 Audubon St., New Haven, Ct.

Special Notices.

MACHINERY.

BARGAINS IN MACHINERY.

12 in. Double Table Shaping Machine.
400-lb. Merrill Drop Hammer.
Planer, 24 x 4.
Engine Lathe, 30 in. x 16 ft.
25-in. B. G. S. F. Upright Drill.
28 in. " " "
30-in. "
20-in. Upright Drill, B. G.
Fitchburg Planer, 22 in. x ft.
Engine Lathe, 22 in. x 12 ft.
Engine Lathe, 15 in. x 6 ft. B. G. Screw-Cutting.
Durrell Seven-Spindle Nut Tapper.
Speed Lathe, 16 x 6 ft.
Engine Lathe, 16 x 6 ft. Power cross-feed.
Engine Lathe, 18 x 8 ft. Power and compound rest.
Small Radial Drill.

Cold-Rolled Shafting, Hangers, Pulleys, &c.

Agents for
L. W. Pond Mach. Co. Planers.
Currier & Snyder Drills.
McMahon & Co. Lathes.

FRASER & ARCHER,
121 Chambers St., New York.

For Sale,

Second-Hand Iron and Wood-Working Tools.

One Engine Lathe, 15 in. x 6 ft. Blaisdell.
One Engine Lathe, 16 in. x 6 ft. Putnam.
Two Engine Lathes, 18 in. x 6 ft. New Haven.
One Engine Lathe, 20 in. x 8 ft. Putnam.
One Gap Chucking Lathe, 24 in. x 48 in. x 10 ft.
One 28-in. Plain Chucking Lathe.
One 90-in. Lathe, 12 feet between centers, not screw-cutting.
One Iron Planer, 30 in. x 24 in. x 6 ft.
One No. 2 Bement Cotter and Key Seat Cutter.
One 8 in. Bement Double Cutting Off and Centering Machine.
One 72-in Niles Radial Drill.
One 12 ft. Sellers Boring and Turning Mill.
One Punch to punch 5/8 x 5/8 in., 8 in. depth of throat. Morgan make.
One Set 4-feet Bending Rolls for hand or power.
One Plate Planer.
One 36-in. Rotary Planer and Column-Facing Machine.
Two Double Bolt Cutters.
One Bolt-Pointing Machine.
One No. 1 Hydraulic Car Wheel Press.
One Large Car Mortising and Boring Machine.
One 3-Spindle Car Boring Machine.
One Angular Car-Boring Machine.
One Heavy Tenoning Machine.
One Medium Tenoning Machine.
One Wood Frame Daniel Planer.
One 24 in. Single Surfacer and Matcher. Goodell & Waters' make.
Two Circular Re-Sawing Machines.
Two Blind-Tapping Machines.
One 36 in. Diagonal Planer. S. A. Woods' make.
One Single-Spindle Shaping Machine.
One New 7½ x 7 Westinghouse Automatic Engine.

U. BAIRD MACHINERY CO.,
75 Water St., Pittsburgh, Pa.

SECOND-HAND MACHINERY.

One 500 H.-P. Corliss Engine.
One 200 "
One 150 " Plain Slide Valve Engine.
One 75 " Naylor Engine.
One 60 " Wilbraham Engine.
One 40 " Reder Cut off Engine, high speed.
One 40 " Supplee Engine.
One 15 " New York Safety Vertical Engine.
One 5 " " " " "
One 6 " Wood, Taber & Morse Port. on wheel.
One 30 " Erie City Iron Works Port. on skids.
One 8 " Shapley Engine and Boiler.
One 50 " Marine Boiler.
One 25 " Locomotive Boiler.
One 50 " Hor. Tubular Boiler.
One 30 " Vertical Tubular Boiler.
One 25 " Hor. Tubular Boiler.
One 22 in. x 10 ft. Pond Engine Lathe.
One 20 in. x 10 ft. N. Y. Steam Engine Co.'s Lathe.
One 16 in. x 6 ft. Harrington Lathe.
One 20 in. x 10 ft. " "
One 10 in. x 6 ft. Ames Lathe.
One 15 in. x 6 ft. Harris Lathe.
One 3 Spindle Drill Press.
One Hand Miller.
One 12-in. Compound Planer.
One large Worthington Duplex Pump.
One Cope & Maxwell Deep Well Pump.
Please write and say what you want. I have a large stock, constantly changing.

HENRY I. SNELL,
135 North 3d Street, Philadelphia.

Rolling Mill Machinery.

One 32 in. x 32 in. Vertical Engine.
Shears for cutting old rails with engine attached.
Shears for cutting finished iron with engine "
Blower with engine.
Furnace Castings and Boilers.
Steam Pumps.
Floor Plates.
One 16 in. Tram Rolls with housings.
" 9 in. " " " "
One Coil Heater, and other parts of Rolling Mill Machinery.

For sale by
DAN'L W. RICHARDS & CO.,
88 to 96 Mangin St., New York.

FOR SALE, CHEAP.

We have a 32-in. by 20-ft.

Screw Cutting Engine Lathe

In very good order, which we offer as a bargain.

— THE —

NEWARK MACHINE TOOL WORKS,

Newark, N. J.

FOR SALE.

A nearly new four-ton Steam Hammer, in first-class condition. Made by the Morgan & Williams Engineering Co., of Alliance, Ohio. Very best manufacture. Address
WORCESTER STEEL WORKS,
Worcester, Mass.

FOR SALE.

A Wright Automatic Engine, 18 x 42. Cylinder and Locomotive Boiler, 21 x 6 feet.
FRANK McSWEGAN & SONS, Bridge Store No. 1, Cor. Dover St. and Franklin Square, New York.

Special Notices.

MACHINERY.

Second-hand Machinery in Good Order. For Sale Cheap.
1 Engine Lathe, 60 in. x 18 ft. Good order.
1 Engine Lathe, 36 in. x 21 ft. Triple Geared.
1 " " 36 in. x 7 ft. 1 Engine Lathe 18 in. x 8 ft.
1 " " each 24 in. x 20 in. and 24 ft.
1 " " 24 in. x 12 ft. bed. Fifield.
1 " " 28 in. x 20 ft. " Pond.
1 " " 22 in. x 16 ft.
1 " " 15 in. x 6 ft. Porter. Rod feed only.
1 each " 16 in. x 6, 8 and 10 ft.
6 " " 14 in. x 6 ft.
1 " " 12 in. x 5 ft.
4 " " 15 in. x 6 ft.
1 " " 13 in. x 5 and 6 ft. Ames. Good as new.
2 " " 11 in. x 4 ft. and 5 ft.
1 " " 10 in. x 3½ ft. Foot power.
1 " " 11 in. x 4 ft.
1 Planer, 20 in. x 20 in. x 4 and 5 ft.
1 " 16 in. x 16 in. x 3 ft. Pratt & Whitney.
1 ea " 21 in. x 24 in. x 5 and 7 ft.
1 " " 36 in. x 36 in. x 7 and 9 ft.
1 " " 30 in. x 30 in. x 7 ft.
1 " " 42 in. x 42 in. x 16 ft.
1 Shaper, 6-in. stroke.
1 " 10-in. stroke. Gould.
1 " each 12, 15, 20 and 28 in. stroke.
1 " 17 in. stroke Shaper, heavy. Pond.
1 Crank Planer. 6 Lincoln Pat. No. 2 Millers.
1 each 3 and 6 Spindles.
2 each Nos. 1 and 2 Screw Machines. Wire Feed. Pratt & Whitney. Good as new.
1 375-lb. Drop Hammer. Beecher & Peck.
1 No. 52 Ferracute Press. 1 Nut-Facing Machine.
10 Foot Presses, assorted.
8 Power " "
12 Punching and Shearing Machines, assorted.
2 Return Tubular Boilers, 45 H.-P.
1 National Bolt Cutter, sizes, ¼ in. to 1 in.
2 each Nos. 2 and 3 Garvin Hand Millers. Good as new.
1 Horizontal Engine each 25 and 45 H.-P.
1 Vertical Engine, 10 H.-P. 1 Upright Drill, 28 in. B. G.
1 Upright Drill. B. G. 32 in. swing.
1 Die Sinking Machine. Pratt & Whitney.
48-in Boring and Turning Mill. Pond.
2 Screw Presses. 1 Valve Miller.
1 No. 2 Screw Machine. Plain. Browne & Sharpe.
1 2-Spindle Profiling Machine.
1 Horizontal Boring Machine, 36 in. x 6 ft.
1 6-H.-P. Baxter Engine. 1 20 in. Upright Drill.
1 48 in. Gear Cutter. Power feed. Almost new.
Also full line of New Machinery.
New York Agency TAYLOR MFG. CO., Engines, Boilers, &c. Correspondence solicited.
PRENTISS TOOL AND SUPPLY CO.,
P. O. Box 3362. No. 42 Dey St., New York City.

REMOVED.

The Machine Tool Business of

E. P. BULLARD,

— AND THE —

Bridgeport Machine Tool Works,

Established at 14 Dey Street, in 1875, has been removed to the new and commodious stores,

No. 72 Warren St. and 62 College Place,

Near Chambers Street Station of the 6th Avenue Elevated R. R.

Send for new list of tools for immediate delivery.

New York, April, 1887.

FOR SALE,

1 Cupola 66 in. dia. x 40 ft. long.
1 " 50 in. " x 40 ft. "
Castings and Chains for 2 10-ton Cranes.
1 Tubular Boiler 42 in. x 12 ft. long.
42 3-in. Tubes, all nearly new, will be sold cheap.
Address WM. FITZSIMONS,
626 Broadway, Cleveland, Ohio.

HORSESHOE MACHINERY.

Parties with experience, owning new and valuable patents and improvements for machinery in the manufacture of Horseshoes, desire correspondence with mill owners or parties contemplating the business.

"HORSESHOE,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

WANTED,

A small, second-hand

HOT-AIR ENGINE

for house-pumping. Give maker's name, age, condition, location and price.

"J.," Box 261, Wheeling, W. Va.

Wanted to Buy,

SECOND HAND ENGINE LATHES AND IRON PLANERS. MUST BE CHEAP.

FOSDICK & PLUCKER,

SIXTH and CULVERT STS., CINCINNATI, OHIO.

FOR SALE,

One standard gauge Locomotive, weight about 10 tons, cylinders 7 x 16 in., 4 drivers 36 in. dia., front trucks 22 in. dia., tender on 4 wheels 24 in. dia., tender will hold water for 25 miles run and coal for 100 miles. Eight Flat Cars on 4 wheels each 26 in. dia., with heavy axles. The whole outfit is in good, fair shape and will be sold cheap, as the owner has no further use for it. Address WM. FITZSIMONS,
626 Broadway, Cleveland, Ohio.

WANTED,

a Vertical or Guillotine Shears, either new or second-hand, that will cut 60 in. x ¾ in. thick. Address

"W."
P. O. Box 33, N. Y. City.

FOR SALE.

A complete set of Horizontal Blowing Machinery suitable for blowing a medium-sized Blast-Furnace Engine, 22 in. x 48 in., strongly geared, 3½ to 1; blast cylinders, 60 in. x 66 in. Built by R. S. Newbold & Son. All in first-class order. Can be examined on foundations. Apply to
SCHALL, STEACY & DENNEY,
York, Pa.

FOR SALE.

Large lot second-hand Iron Tanks, all sizes and shapes, from 5000 gals. down, about 50 new two barrel Oil Tanks with pumps, all complete. Second hand Boiler Shells for stacks and tanks; 1 fly wheel 6½ in. diameter, 14½ in. face, 5 in. bore. Cast Iron Kettles. Second hand Engines and Boilers. Wrought and Cast Scrap, Red and Yellow Brass, Copper, Lead and Zinc. BUSSENIUS, CUNLIFFE & CO., Dealers in Scrap Iron and Old Metals, 12th and Washington ave., Philadelphia.

Special Notices.

MACHINERY.

SECOND-HAND MACHINE TOOLS.

We have the following Machine Tools, taken mainly in exchange for those of our own manufacture. We will sell them low:

PLANERS.—Second-hand, good order.
1 16x16x42 Iron Planer, Gould.
1 22x22x4½ " " Lathe & Morse.
1 20x20x4 " " " "
1 22x22x4½ " " Thayer & Houghton.
1 24x24x5 " " " "
1 28x26x7 " " " "
1 29x26x5⅔ " " Cove Manufacturing Co.
1 30x30x8 " " Pond.
1 36x36x9 " " Niles.

PLANERS.—New.
1 20x20x4 Iron Planer, Williams.
1 24x24x6 " " Pease & Co.
1 30x30x8 " " " "
1 22x22x4½ " " " "

LATHES.—Second-hand, good order.
1 17x 8 Engine Lathe.
1 18x 6 " " New Haven.
1 18x 8 " " Lodge, Barker & Co.
1 18x 8 " " Pond.
1 19x 8 " " Lodge, Barker & Co.
1 20x 8 " " Fifield.
1 27x12 " " New Haven.
1 35x12 " " Harrisburg Manufacturing Co.
1 29x12 " " " " "
1 30x12 " " New Haven " " "

LATHES.—New.
1 12x36 bet. Centres, Eng. Lathe, Sebastian, May & Co.
1 14x10 " " " " " " "
1 17x 6 Engine Lathe, Muller Machine Tool Co.
1 17x 8 " " " " "
1 17x 6 " " Wm. Barker & Co.
1 17x 8 " " " "
1 26x10 " " Dustin Manufacturing Co.
1 26x12 " " " " "
1 Hand Fox Lathe, Plain, Lodge, Davis & Co.
1 " " " Dove-tail set over, Lodge, Davis & Co.
1 12 " Monitor Lathe, " " "
1 16 " " " " " "
1 13x5 Turret Chucking Lathe " " "
1 16x6 " " " " " "
1 19x6 " " " " " "
1 22x6 " " " " " "

MISCELLANEOUS.—Second-hand, good order.
1 Horizontal Boring Mill, Pond.
1 Car Wheel " " Sellers.
1 Gear Cutter, Putnam.
1 20-inch Drill Press, Bickford.
1 24 " " " "

MISCELLANEOUS.—New.
1 24-inch Bickford Drill
1 28 " " " Back Gear and Self Feed.
1 28 " " " " " " "
1 32 " " " " " " "
1 38 " " " " " " "
1 No. 1 Radial Drill (Drills to centre of 8 feet), Universal Radial Drill Co.
Post Drills, all sizes, Boynton & Plummer.
1 Bolt Cutter, Wells Bros.
2 Key Seaters (small), Davis.
2 " " (large), "
1 6-inch Shaper, Boynton & Plummer.
1 8 " " " "
1 10 " " " "
1 10 horse-power Engine and Boiler Upright.
2 Water Grinders, Diamond Emery Wheel and Machine Co.

Write for prices. New additions constantly made to this list. Complete estimates made on outfits.
LODGE, DAVIS & CO., CINCINNATI, OHIO, Manufacturers of Engine Lathes, Shapers, Upright Drills, &c. Dealers in Iron and Brass Working Machinery.

BY WM. SEEMULLER & CO., AUCTIONEERS.

Important Public Sale of

VALUABLE MILL MACHINERY,

At Baltimore, Md.

By direction of the owners, we will sell by public auction, without limit or reserve, on the premises, Nos. 311, 313, 315 and 317 Smith's Wharf, Baltimore, on Tuesday, the 7th day of June, 1887, commencing at 10 o'clock A.M.

ALL THE VALUABLE MACHINERY CONTAINED IN THE LINSEED OIL MILL

there located, embracing improved MACHINERY, TOOLS, &c., costing over $50,000, including Horizontal Engine and Boiler of 100 horse-power, with all appliances: Steam Pumps, Upright and Horizontal Hydraulic Presses, Pumps and Heating Tables; three sets of very superior "Chasers" or Edge Stones; four Storage Tanks, with capacity of about 42,000 gallons; Kettles, Shafting, Pulleys, Hangers, Gearing, Hoisting Machine, by Otis Bros. & Co.; Elevators, Belting, Dies and all the appurtenances of a well appointed Linseed Oil Mill.

This Machinery is sold for the purpose of closing an estate, and will afford an excellent opportunity to persons desiring to embark in the business of manufacturing linseed oil.

Catalogues containing full and particular description can be had upon application to the undersigned. Sale positive. Terms Cash.

WM. SEEMULLER & CO., Auctioneers.

HYDRAULIC CENTERING MACHINE.

Perfection in all kinds of heavy centerings particularly adapted to car axles. Axles centered at a cost of less than one cent per axle. Will center perfectly 600 axles per day of ten hours. When thus centered, the centers being pressed in, are firmer and not liable to get out of shape, and can be turned faster and better than can be done when centered on any other machine. We have on hand one of these celebrated Machines at a great bargain; also several Bolt Headers, Nut Machines, Lathes, Planers, Engines and Boilers. AMERICAN TOOL CO., Cleveland, O.

For Sale.

Engines and Boilers, New and Second-Hand and Ready for Delivery.

One Allen Automatic Engine, 12 x 30, Band Fly-Wheel, 12 ft. diameter, 19 in. face, in halves. One each 12 x 24 and 11 x 22 Plain Slide. One each 5 x 7, 6 x 12 and 12 h.-p. Portable. One each 4 x 6, 6 x 8 Upright. One 5 h.-p. Shapley. One, each, 4 x 4, 4 x 5, 9 x 12 Yacht Engines. Boilers, 2 to 100 h. p.

Wood and Iron Working Tools, New and Second-Hand.

One S. A. Woods 24 in. six-roll Double Surfacer. Seven Saw Tables, four Power Mortisers, three Tenoners, four Moulders, two Stickers, three Boring Machines, two Band Saws, two Resaws, Waymoth Lathe, Variety Moulder, Milling Machine, Merrill 60-lb. Hammer (friction), with air cushion, and numerous other Tools. If you don't see what you want, write for it. Address
SYMMES & DONALDSON,
10 James Slip, New York.

FOR SALE at very low prices.

One Horizontal Engine, 36 in. x 48 in.
One "Corliss" Engine, 18 in. x 48 in.
One "Green" Automatic Engine, 12 in. x 42 in.
One Plain Slide Valve Engine, 1- in. x 26 in.
One "Burdon" Engine, 12 in. x 36 in.
One "Burdon" Engine, 9 in. x 24 in.
One Pair of "Corliss Engines," 2- in. x 48 in.
One Pair of Reversible Engines, 15 in. x 16 in.
One Pair of Reversible Engines, 18 in. x 42 in.
One Pair of Hoisting Engines, 8 in. x 10 in.
Two New Engines, 14 in. x 14 in.
One Winding Drum for 500 feet wire rope.
One "Guild & Garrison" Balance Wheel Steam Pump, 10 in. x 5 in. x 6 in. stroke.
One "Otis" 6000 lbs. Belt Elevator.

E. A. CARROLL,
285 Water St., Cor. Dover, New York City.

!! For Sale Cheap !!

Baker Blowers, Nos. 4½ and 5.
Root Blowers, Nos. ½, 1, 2 and 5.

Sturtevant Blowers, Nos. 5, 6, 7 and 8; do. Exhausters, Nos. 4, 6, 52, 35 and 39; Stone Crushers, 4 x 8 and 4 x 10 in.; Bogardus Mill, No. 5; Otto Gas Engines, 2 and 7 H. P.; 8 x 9 and 9 x 12. New York S. S. P. Engines; Ingersoll Straight Line Air Compressors, 24 x 30 in.; and other machinery not mentioned. Correspondence solicited by C. R. BIGELOW, M. E., 45 Dey St., N. Y.
N. B.—I would like to hear from any person wishing to buy or sell Root or Baker Blowers.

A LOCOMOTIVE FOR SALE, CHEAP.

One (1) Standard Guage (4 ft x 8½ in.) Engine; size of Cylinder, 14½ in. x 22 in.; Four (4) 5 ft. 6 in. Drivers; weight on drivers 34,000 pounds; total weight on drivers and truck, 56,000 pounds; Krupp Tires 2¼ in. thick. In condition for immediate use. Apply to
SWARTS & NATHAN,
555 to 557 State St., Chicago, Ill.

FOR SALE.—LOCOMOTIVE,

four wheel with tender; 3 feet gauge; in good order. CLEVELAND STOVE CO.,
Cleveland, Ohio.

Special Notices.

MACHINERY.

GREAT BARGAINS IN MACHINERY.

1 14 in. x 30 in. Corliss Automatic Engine, New.
1 14 x 20 Horizontal Engine.
1 12 x 24 " "
1 9 in. x 16 in. " " New.
1 8 in. x 15 in. " " "
1 8 in. x 12 in. Ames Engine. Nearly new.
1 8 in. x 10 in. Portable Engine and Boiler.
1 5 in. x 10 in. Horizontal Engine.
1 10 H.-P. Baxter Engine, with 15 H.-P. Boiler.
1 4 H.-P. Portable Engine and Boiler.
1 6 Horse-Power Upright Engine.
1 5 x 12 Double Drum Hoisting Engine and Boiler.
2 8 x 10 Hoisting Engine and Boiler.
1 5 ft. x 16 ft. Horizontal Tubular Boiler.
1 4 ft. x 15 ft. Horizontal Tubular Boiler.
1 3 ft. x 1- ft. " " "
1 36 in. x -- ft. New Locomotive Boiler.
1 42 in. x 7 ft. Upright Boiler.
2 New Steel Yacht Boilers.
1 24 in. x 12 ft. Engine Lathe.
2 10 in. x 6 ft. " "
1 14-in. Stroke, Hewes and Phillips Shaper.
1 36 in. Back-Geared Drill. Self-Feed.
2 60 in. " "
1 Ames 4-Spindle Drills.
1 Pratt & Whitney 4-Spindle Drill.
1 Double-Spindle Milling Machine.
1 12 in. Heavy Slotting Machine.
1 large Styles & Parker Press.
1 4 in. Morris & Tasker Pipe Threading Machine.
1 set Rubber Grinding Rolls.
9 Tanks, 8 ft. x 5 ft. x 5 ft. 3 in.
1 Tank, 8 ft. diam. x 8 ft. high.
1 " 5½ ft. diam. x 5½ ft. high.
Nos. 3, 4, 5 and 6 Woodward Steam Pumps.
1 6 ft. Vacuum Pan.
1 14 in. Guild & Garrison Vacuum Pump.
1 Set Power Shears, cut any width.
1 Boiler Makers' Power Punch, Heavy.
1 No. 8 Sturtevant Blower and Countershaft.
1 7 x 10 Blake Crusher.
4 4 ft. Burr Mills, Complete.

ROBT. J. CRAY 502 West St., New York.

MACHINERY AND ENGINES,

Second-Hand and New.

ENGINES.
100 Horse-Power, 16 x 30 Cylinder, automatic cut-off, good as new, used only short time, very fine Engine and bargain.
One new 200 Horse-Power, 20 x 40, automatic cut-off.
One 12 Horse-Power, Vertical.
One 35 Horse-Power, 8½ x 10, Armington & Simms, good as new.
One each, 3, 5, 6, 8, 10 Horse-Power Vertical Engines.

ENGINE LATHES.
28 in. x 20 ft. bed.
24 in. x 14 ft. bed. Aldridge.
28 in. x 12 ft. bed. Lambert.
20 in. x 8 ft. bed. Lambert.
Several small lathes, 12 in., 14 in., 16 in. swing.

PLANERS.
36 in. x 36 in. x 12 ft. Bement.
40 in. x 20 ft., to mount on mason work.
3- in. x 26 in. x 9 ft., Steel. Barridge.
24 in. x 22 in. x 6 ft. Chamberlain.

DRILL PRESSES.
One 25-in. Swing, self feed and back-gear.
Two 20-in. Swing, screw and lever feed.

Estimates on new machinery and shop outfits of all kinds. *Shafting in stock*; Pulleys, Hangers and Belting.

C. L. JACKSON & CO.,
14 W. German St., Baltimore, Md.

FOR SALE.

One No. 1 Hot-Pressed Nut Machine, makes from ⅝ to 1⅛-inch Bolt.
One No. 2 Hot-Pressed Nut Machine, makes from ⅜ to ⅞-inch Bolt.
One No. 3 Hot-Pressed Nut Machine, makes from ¼ to ½-inch Bolt.
One No. 2 Washer Machine, makes from 3-16 to ⅞-inch Bolt.
One Six-Spindle Nut-Tapping Machine, upright; will tap nuts from ⅜ to ⅞ bolt.
All above machines made by York and Smith. All in good order, and practically as good as new. The nut machines make both square and hexagon nuts.
FOWLERVILLE NUT AND BOLT CO., LIMITED,
Fowlerville, Livingston Co., N. Y.

WANTED,

A FIRST-CLASS MAN to take charge of MACHINERY FOR MAKING HORSE SHOES. Permanent employment. Also one or two BOAT SPIKE MACHINES.
Second-hand Machines in good order will suit. Address,
P. O. Box 12, Richmond, Va.

ENGINES FOR SALE.

One Horizontal Corliss Engine	34 x 60.
One Horizontal Engine	32 x 54.
Two Horizontal Green Engines	28 x 60.
One Horizontal Corliss Engine	26 x 48.
One Horizontal Corliss Engine	20 x 48
One Horizontal Corliss Engine	18 x 48.

Send for revised list.
D. B. CRUICKSHANK,
243 Dyer St., Providence, R. I.

FOR SALE.

one second-hand, large, 4-post

ROTARY SQUEEZER,

built by the Birmingham Iron Foundry; also one Nasmyth hammer; Bement cylinder, 12 in. x 30 in.; wrought iron ram, 2400 pounds; 4-inch steel piston. Apply to
E. H. WILSON & CO.,
222 and 224 South Third St., Philadelphia, Pa.

WANTED,

FINISHING ROLLS

for rolling all sizes of bar iron, flats and rounds; also Straightening Plate for same. Address
"W. A. J. C. H.,"
Office of *The Iron Age*, 66 and 68 Duane st., N. Y.

FOR SALE, ONE R.R. SPIKE MACHINE, makes all sizes; ONE NUT MACHINE, ½ inch to 1 inch; ONE BOLT HEADER. Will exchange for bar iron or spikes. Address "SPIKES," Office of *The Iron Age*, 66 and 68 Duane Street, N. Y.

PRICE BOOKS.

LARGE SIZE, 500 Pages, 6 x 9½ in. each, $8.00.
POCKET SIZE, 250 Pages, 4 x 7 in., each, $4.00.
Send for Circulars.

B. LAMBERSON,

PORTLAND, OREGON.

OFFICE TO LET.

Room 5, No. 102 Chambers Street, New York, in center of Hardware District, pleasant office, up one flight. Apply to Janitor or address
A. C. FARLEY & CO., Limited,
Philadelphia.

POWER TO LET.

One-hundred Horse-Power .... $500 per annum
More than 100 Horse-Power .... Special Terms.
Central New York. Three Competing Railroads. Railroad Branch on premises.
"POWER & CO.,
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Special Notices.

MISCELLANEOUS.

METALLURGICAL ENGINEERING.

I am prepared to furnish

PLANS, SPECIFICATIONS and ESTIMATES

AND TO

SUPERINTEND THE CONSTRUCTION OF ROLLING MILLS AND MACHINERY, REGENERATIVE GAS FURNACES, TUBE AND PIPE MILLS, ETC., ETC.

I represent the latest improvements in all the above branches.

M. V. SMITH, Metallurgical Engineer,
Rooms 16, 17, and 18 Bissell Block, Pittsburgh, Pa.

The Techno-Chemical Receipt Book.

NOW READY.

The Techno-Chemical Receipt Book.

Containing Several Thousand Receipts, covering the Latest, Most Important and Most Useful Discoveries in Chemical Technology, and their Practical Application in the Arts and Industries. Edited chiefly from the German of Drs. Winckler, Elsner, Heintze, Mierzinski, Jacobsen, Koller and Heinzerling, with additions by William T. Brannt, graduate of the Royal Agricultural College of Eldena, Prussia, and William H. Wahl, Ph. D. (Heid.), secretary of the Franklin Institute, Philadelphia, author of "Galvanoplastic Manipulations." Illustrated by 78 engravings, in one volume, over 500 pages, 12 mo, closely printed, containing an immense amount and a great variety of matter. Elegantly bound in scarlet cloth, gilt. Price $2, *free of postage to any address in the world.*

☞ A circular of 32 pages, showing the full Table of Contents of this important Book, sent by mail, free of postage, to any one in any part of the World who will furnish his address.

HENRY CAREY BAIRD & CO.
Industrial Publishers, Booksellers and Importers
810 Walnut st., Philadelphia, Pa., U. S. A.

AGENTS WANTED.

In every manufacturing town to sell

DuPlaine's Plumbago Babbitt Metal.

Very liberal discount allowed and every inducement given you to make sales. Remember these are the Best Anti-Friction Metals made.

Address
E. A. C. DUPLAINE,
Send for Circular. Chicago, Ill.

FOR SALE.

Ten (10) No. 2 Siemens' Regenerative Gas Lamps, with Factory Fixtures and Reflectors complete and in order; only used three or four months. Will be sold cheap.

Danville Nail & Mfg. Co.,
Danville, Pa.

TO BRIDGE BUILDERS.

Inquire of S. Nonamaker, Ringoes, N. J., for

SPECIFICATIONS OF AN IRON BRIDGE

of 80 feet span, to be built over the Neshanic, near Clover Hill, N. J.

COMMITTEE.

A TIN OR METAL ROOF, painted with two coats of DIXON'S SILICA GRAPHITE PAINT, and a third coat the following season, will not need painting again for 10 years or longer.

JOS. DIXON CRUCIBLE CO.,
Jersey City, N. J.

EUGENE BISSELL, Auctioneer.

HAYDOCK & BISSELL,

Successors to
ROBERT R. HAYDOCK & CO., and E. BISSELL & CO.
WHOLESALE
HARDWARE AUCTIONEERS,
12 Murray St. and 15 Park Place, N. Y.
Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

SITUATIONS WANTED.

Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.

TO WIRE MANUFACTURERS.—A man who thoroughly understands the manufacture of all kinds of wire is open for an engagement as SUPERINTENDENT or Assistant Superintendent; highest references. Address "H. W. P.," Lock Box 1,86, Philadelphia.

MECHANICAL DRAUGHTSMAN, graduate M. E., with first-class references, wishes a position; able to take charge of drawing office and act as Assistant Superintendent; can offer knowledge against capital; the three languages fluently; 14 years' American and European experience. "E. S.," 24, Office of *The Iron Age*, 66 and 68 Duane St., New York.

BY A MAN OF STEADY HABITS and good address, with 12 years' experience of general machinery, a position as ASSISTANT IN MACHINERY AGENCY. Address J. B. ROBINSON, Box 3--, Bucyrus, Ohio.

A PRACTICAL HARDWARE MAN, whose experience of twenty-one years comprises nearly every detail of the business, both on the road and in the store, and who for a number of years has had full management of a large business, is open for engagement; the highest references as to character, ability, &c. "CUPBOARD CATCHES," Lock Box 1086, Philadelphia.

WANTED—A situation as SALESMAN in Hardware or Cutlery Trade by young man, age 24, tall, steady and of good address; had six years' experience. Travel if desired. Address "M. O. N.," Box 9, office of *The Iron Age*, 66 and 68 Duane St., New York.

POSITION AS SALESMAN AND STOCK CLERK by an experienced Hardware man; would travel if desired; best of references given. Address "M." Box 1-, Office of *The Iron Age*, 66 and 68 Duane Street, New York.

POSITION by a man of twenty years' experience in FOUNDRY AND MACHINE BUSINESS and furnace work; can make patterns, and has had five years' experience in bookkeeping for an iron works and fifteen years' experience in machinery works. Address "SITUATION," office of *The Iron Age*, 77 Fourth Av., Pittsburgh, Pa.

(Continued on page 28.)

CURRENT HARDWARE PRICES,

JUNE 1, 1887.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.
Caps, Percussion, ℘ 1000—
Hicks & Goodmark's
F. L. Waterproof, 1-10's .... 50¢
E. B. Trimmed Edge, 1-10's .... 65¢
E. B. Ground Edge, Central Fire, 1-10's .... 70¢
Double Waterproof, 1-10's .... $1.40 } dis 25 %
Musket Waterproof, 1-10's .... 54¢
G. D. .... 28¢
S. B. .... 30¢
Union Metallic Cartridge Co.
F. C. Trimmed .... 50¢
F. L. Ground .... 65¢
Cen. Fire Ground .... 70¢
Double Waterproof $1.40
Double Waterproof, in 1-10's .... $1.40 } dis 25 %
S. B. Genuine Imported .... 45¢
Eley's E. B. .... 56¢
Eley's D Waterproof, Central Fire $1.60
Cartridges—
Rim Fire Cartridges .... dis 60&2 %
Rim Fire Military Cartridges .... dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle .... dis 40&2 %
Cen. Fire Cartridges, Military & Sporting .. dis 30&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges, 22 cal .... $1.50, dis 2 %
Blank Cartridges, 32 cal .... $3, dis 2 %
Primed Shells and Bullets .... dis 25&2 %
B. B. Caps, Round Ball .... $1.60, dis 2 %
B. B. Caps, Conical Ball, Swaged .... $1.75, dis 2 %
Primers—
Berdan Primers, all sizes, and B. L. Caps (for Sturtevant Shells) .... 90¢, dis 2 %
All other Primers, all sizes .... $1.10, dis 2 %
Shells—
Paper Shot Shells, 1st & 2d or S. G. qual .... dis 15&2 %
Seibold's Combination Shot Shells .... dis 15&2 %
Paper Shot Shells, Club, Rival, Climax .... dis 15&2 %
Paper Shot Shells, Star Brand .... dis 25&2 %
Brass Shot Shells, 1st quality .... dis 60&2 %
Brass Shot Shells, Club, Rival & Climax .... dis 65&2 %
Wads—
U. M. C. & W. R. A.—B. E., 11 up $2.00
U. M. C. & W. R. A.—B. E., 9&10 .... 2.30
U. M. C. & W. R. A.—B. E., 7&8 .... 2.60
U. M. C. & W. R. A.—P. E., 11 up 3.10
U. M. C. & W. R. A.—P. E., 9&10 .... 4.00
U. M. C. & W. R. A.—P. E., 7&8 .... 490 } dis 20&2 %
Eley's B. E., 11 up $1.75
Eley's P. E., 11 @ 20 .... $2.80

Anvils.—Eagle Anvils .... ℘ ℔ 10¢, dis 20 @ 20&5 %
Wright's .... 9½¢
Armitage's Mouse Hole .... 9¢
Armitage Mouse Hole, Extra .... 11½¢
Trenton .... 9¼¢@9½¢
Wilkinson's .... 9¾¢@10¢
J. & Riley Carr, Patent Solid .... 11@11½¢
Anvil Vise and Drill—
Millers Falls Co. .... $18.00, dis 20 %
Cheney Anvil and Vise .... dis 25 %
Allen Combined Anvil and Vise .... $3, dis 40&10 %
Moore & Hayden Mfg. Co., No. 2, ℘ gro., $30; No. 3, $90

Augers and Bits.
Douglass Mfg. Co.
New Haven Copper Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher)
Connecticut Valley Mfg. Co } dis 60&10 @ 60&10&5 %
Cook's, Douglass Mfg. Co. .... dis 55 %
Cook's, New Haven Copper Co. .. dis 50&10@50&10&5 %
Ives' Circular Lip .... dis 60 %
Patent Solid Head .... dis 30 %
C. E. Jennings & Co., No. 10, extension lip .... dis 40 %
C. E. Jennings & Co., No. 30 .... dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ℘ set, 32⅛ quarters, No 5, $5; No. 3C, $3 .... dis 20 %
Lewis' Patent Single Twist .... dis 45 %
Russell Jennings' Augers and Bits .... dis 25 %
Imitation Jennings Bits, new list .... dis 50&10&5@60 %
Car Bits .... dis 50&10@60 %
L'Hommedieu Car Bits .... dis 15 @ 20 %
Forstner Pat. Auger Bits .... dis 10 %
Hollow Augers—
Ives'
French, Swift & Co.
Douglass' } dis 25&10 @ 25&10&5 %
Bonney's Adjustable ℘ doz. $48 .... dis 40&10 %
Stearns' .... dis 20&10 %
Ives' Expansive, each $4.50 .... dis 50 @ 50&10 %
Universal Expansive, each $4.50 .... dis 20 %
Wood's .... dis 25 @ 25&10 %
Expansive Bits—
Clark's small, $18; large, $26 .... dis 35 @ 35&5 %
Ives' No. 4, per doz., $60 .... dis 35 @ 40 %
Swan's .... dis 40 %
Steer's, No. 1, $26; No. 2, $22 .... dis 35 %
Stearns' No. 2, $18 .... dis 20 %
Gimlet Bits—
Common .... ℘ gross $2.75 @ $3.25
Diamond .... ℘ doz. $1.10, dis 25&10 %
"Bee" .... dis 25 @ 25&5 %
Double Cut, Shepardson's .... dis 45 @ 50 %
Double Cut, Ct. Valley Mfg. Co .... dis 30&10 %
Double Cut, Hartwell's, ℘ gro, $6.50 .... dis 10 %
Double Cut, Douglass' .... dis 40&10 %
Double Cut, Ives' .... dis 50&10 @ 60 %
Bit Stock Drills—
Morse Twist Drills .... dis 50&10 %
Standard .... dis 50&10 %
Cleveland .... dis 50&10 %
Syracuse, for metal .... dis 50&10 %
Syracuse, for wood (wood list) .... dis 30 @ 30&5 %
Williams' or Holt's, for metal .... dis 50&10&10 %
Williams' or Holt's, for wood .... dis 40&10 %
Ship Augers and Bits—
L'Hommedieu's .... dis 15 @ 20 %
Watrous's .... dis 15 @ 20 %
Snell's .... dis 15 @ 20 %
Snell's Ship Auger Pattern Car Bits .... dis 15 @ 20 %

Awl Hafts.
Sewing, Brass Ferrule .... $3.50 ℘ gross—dis 45&10 %
Patent Sewing, Short .... $1.00 ℘ doz—dis 40&10 %
Patent Sew'ng, Long .... $1.20 ℘ doz.—net
Patent Peg, Plain Top .... $10.00 ℘ gross—dis 45&10 %
Patent Peg, Leather Top .... $12.00 ℘ gross—dis 45&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common .... ℘ gross $1.70—dis 35 %
Awls, Shouldered Peg .... ℘ gross $2.45—dis 40@40&10 %
Awls, Patent Peg .... ℘ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad .... $2.70 ℘ gross—dis 35 %
Awls, Handled Brad .... $7.50 ℘ gross—dis 45 %
Awls, Handled Scratch .... $7.50 ℘ gross—dis 35&10 %
Awls, Socket Scratch .... $1.50 ℘ doz—dis 25 @ 30 %

Awl and Tool Sets.
Aiken's Sets Awls & Tools, No. 20, ℘ doz. $10—dis 50&10 %
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9, dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18, dis 25 %
Henry's Combination Haft .... ℘ doz. $6
Brad Sets, No. 42, $10.50, No. 43, $12.50 .... dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50,
Brad Sets, Stanley's Excelsior, No. 2, $4.00,
Brad Sets, Stanley's Excelsior, No. 3, $5.50, } dis 30&10 %

Axes.
Makers' and Special Brands—
First quality .... ℘ doz. $6.75
Others .... ℘ doz. $5.75 @ $6

Axle Grease.
Frazer's, in bulk .... Keg ℘ ℔, 4¢; Pail, ℘ ℔, 5¢ net
Frazers, in boxes .... ℘ gross $9.50
Dixon's Everlasting, in bxs., ℘ doz., 1 ℔: $1.20; 2 ℔, $2
Dixon's Everlasting .... 10-℔ pails, each, 85¢
Lower grades, special brands .... ℘ gro $5.50 @ $7

Axles.—Nos. 1 to 6 .... 3¾¢; Short bed, 4½¢
Nos. 7 to 18 .... dis 60&5@60&10 %
Nos. 19 to 22 .... dis 60&10@60&10&5 %
Nos. 23 to 26 .... dis 50&10 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 6) and Special Farm (A1 to A5)
Less than 10 sets .... dis 33⅓ %
Over 10 sets .... dis 33⅓&5 %
X Strong Exp (6 to 9) & XX Strong Truck (10 to 16):
Less than 10 sets .... dis 10 %
Over 10 sets .... dis 10&5 %

Bag Holders.
Sprengle's Pat., ℘ doz $18 .... dis 60 %
Balances.—Spring Balances .... dis 50 %
Common 24 ℔ .... ℘ doz., $1.50—dis 50 %
Chatillon's Spring Balances .... dis 50 %
Chatillon's Circular Spring Balances .... dis 60 %

Bells.
Hand—
Light Brass .... dis 75&10 %
Extra Heavy .... dis 65&10 @ 70 %
White Metal .... dis 70 @ 70&10 %
Silver Chime .... dis 25&10&5 %
Globe (Cone's Patent) .... dis 25&10 @ 35 %
Door—
Gong, Abbe's .... dis 25&10 @ 35 %
Gong, Yankee .... dis 40&10 %
Gong, Barton's .... dis 40&10 @ 50 %
Crank, Taylor's .... dis 25&10 %
Crank, Brooks' .... dis 50&10&2 %
Crank, Cone's .... dis 10 %
Crank, Connell's .... dis 20&10 %
Lever, Sargent's .... dis 60&10 %
Lever, Taylor's Bronzed or Plated .... net
Lever, Taylor's Japanned .... dis 25&10 %
Lever, R. E. M'f'g Co.'s .... dis 50&10&2 %
Pull, Brook's .... dis 50&10&2 %
Pull Western .... dis 25&10 %
Cow—
Common Wrought .... dis 60&10 %
Western .... dis 20&10 %
Western, Sargent's list .... dis 70&10 %
Kentucky "Star" .... dis 20&10 %
Kentucky, Sargent's list .... dis 70&10 %
Dodge, Genuine Kentucky, new list dis 70@70&10 %
Texas Star .... dis 50&10 @ 50&10&5 %
Call .... dis 40@40&5 %
Farm Bells .... ℘ ℔, 2¼ @ 2½¢
Steel Alloy Church and School Bells .... dis 40 %
Bellows.—Blacksmiths' .... dis 30&10 @ 30&10&5 %
Molders' .... dis 50@50&5 %
Hand Bellows .... dis 50@50&5 %

Belting, Rubber.
Common Standard .... dis 75&5 %
Standard .... dis 70&10 @ 70&10&5 %
Extra .... dis 60&10 @ 60&10&5 %
N. Y. B. & P. Co., Standard .... dis 70&5 %
N.Y.B.&P.Co., Extra Standard .... dis 60&5 %

Bench Stops.
Morrill's .... ℘ doz $9—dis 50 %
Hotchkiss's .... ℘ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9 .. dis 25&10&5 %
McGill's .... ℘ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.
Extension, Barber's .... ℘ doz $15.00—dis 40 @ 40&10 %
Extension, Ives' .... ℘ doz $20.00—dis 60&5 @ 60&10 %
Diagonal .... ℘ doz $24.00—dis 40 %
Angular .... ℘ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic .... ℘ per doz $3.00—dis 33⅓ %
Excelsior .... ℘ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking .... dis 20 @ 20&10 %

Blind Fasteners.
Mackrell's .... ℘ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern .... $15 ℘ gro.—dis 60&10 %
Van Sand's Old Pattern .... $15 ℘ gro.—dis 55&10 %
Washburn's Old Pattern .... $9 ℘ gro. net
Merriman's .... new list, net
Salisbury & Austin No. 2008 .... $9 ℘ gro. net
Security Gravity .... $9 ℘ gro. net

Blind Staples.
Barbed, ½ in. and larger .... ℘ ℔ 8 @ 8½¢ net
Barbed, ⅜ in .... ℘ ℔ 9 @ 9½¢ net

Blocks.
Ordinary Tackle Blocks, list April 17, '85 .... dis 50&10 @ 60&10 %

Bolts.
Door and Shutter—
Cast Iron Barrel, Square, &c .... dis 70 @ 70&10 %
Cast Iron Shutter Bolts .... dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list) .... dis 65&10 %
Ives' Patent Door Bolts .... dis 55 %
Wrought Barrel .... dis 70 @ 70&10 %
Wrought Square .... dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list .... dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's .... dis 40&10 %
Wrought Shutter, Sargent's list .... dis 60&10 %
Wrought Sunk Flush, Sargent's list .... dis 55&10 %
Wrought Sunk Flush, Stanley's list .... dis 40&10&5 %
Wrought B.K.Flush, Com'n Stanley's list .. dis 55&10 %
Carriage—
Com. list June 10, '84 .... dis 70&15 %
Genuine Eagle, list Oct., '84 .... dis 75 @ 75&5 %
Phila. pattern, list Oct. 7, '84 ... dis 75&10@75&10&5 %
R. B. & W., old list .... dis 70 %
Tire—
Common, list Feb. 28, 1883 .... dis 65&10 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883, dis 65&10 %
P. C. B. & N. Co., Philadel., list Oct. 84 .... dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list, Oct. '84 .... dis 80 %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84, dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16, '84 .. dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84 .... dis 80 %
Am. S. Co., Philadel. list, Oct. 16, '84 .... dis 82½ %
Am. S. Co., Bay State, list Feb. 28, '83 .... dis 65&10 %
R. B. & W., Philadel. list Oct. 16, 1884 .... dis 82 %
R. & E. Mfg. Co .... dis 65 %
Stove and Plow—
Stove .... dis 65 %
Plow .... dis 60&5 %
Am. S. Co. Stove, Annealed .... dis 65 %
R. B. & W., Plow .... dis 55 %
R. B. & W., Stove .... dis 65 %
R. & E. Mfg. Co., Stove .... dis 65 %
Machine .... dis 70@70&7½ %
Bolt Ends .... dis 70@70&7½ %
Borax .... ℘ ℔ 6½¢

Boring Machines.

Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75	dis 50 %
Snell's, Rice's Patent	5.50	6.75	dis 40&10&10 %
Jennings	5.50	6.75	dis 45@45&10 %
Other Machines	2.35	2.75	net
Phillips' Pat., with Augers	7.00	7.50	net

Bow Pins
Humason, Beckley & Co.'s, Nos 1 and 2—dis 60&10 @ 60&10&5 %
Humason, Beckley & Co.'s other Nos. .. dis 70 @ 70&10 %
Sargent & Co.'s .... $17 and $18, dis 60&10 %
Peck, Stow & W. Co .... dis 50&10 @ 50&10&5 %

Braces.
Backus, Nos. 110 to 114 and 31 to 33 .. dis 60&5@60&10 %
Backus, Nos. 6, 8, 12, 14 .... dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7, 9, 11 .... dis 70&10&5 %
Barber's, Nos. 10 to 16 .... dis 50 %
Barber's, Nos. 30 to 33 .... dis 50 %
Barber's, Nos. 40 to 63 .... dis 50&10 %
Barker's, Nos. 8, 10 and 12 .... dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12 .... dis 65&10@70 %
Osgood's Ratchet .... dis 40&10@50 %
Spofford's .... dis 50&10 %
Ives' New Haven Novelty .... dis 70 @ 70&5 %
Ives' New Haven Ratchet .... dis 6 &5 @ 60&10 %
Ives' Barber Ratchet .... dis 60&5 @ 60&10 %
Ives' Barbers .... dis 60&5 @ 60&10 %
Ives' Spofford .... dis 60&5 @ 60&10 %
Common Ball, American .... $1.00 @ $1.10
Bartholomew's, Nos. 25, 27, 30 .... dis 50&10@60&5 %
Bartholomew's, Nos. 117 118, 119 .... dis 70 @ 70&5 %
Amidon's Barker's Imp'd .... dis 60&10&5 %
Amidon's Ratchet .... dis 70 @ 70&5 %
Amidon's Eclipse Ratchet .... dis 50&10 %
Amidon's Globe Jawed .... dis 40&40&10 %
Amidon's Corner Brace .... dis 40 @ 40&10 %
Amidon's Universal .... 8 in., $1.90; 10 in., $2.10
Amidon's Buffalo Ball .... $1.10 @ $1.15
P. S. & W. .... dis 50&10 %

Brackets.
Shelf, plain, Sargent's list .... dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list .... dis 60&10 @ 60&10&10 %
Reading, plain .... dis 55&10 @ 55&10&10 %
Reading, Rosette .... dis 60&10 @ 60&10&10 %
Bright Wire Goods.— .... dis 75&10 @ 75&10&5 %

Broilers.

Henis' Self-Basting	Inch	9	10	9 x 11
	Per doz.	$4.50	5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut .... dis 55 %
Sargent's .... dis 66⅔&10 @ 70&5 %
Hotchkiss' low list .... dis 30 %
Humason, Beckley & Co.'s .... dis 70&10 @ 70&10&10 %
Peck, Stow & W. Co.'s .... dis 50&10 @ 50&10&10 %
Ellrich Hdw. Co. White Metal, low list. dis 50@50&10 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co. .... dis 30&5 @ 40 %
Bradley's .... dis 25 @ 30 %
L. & I. J. White .... dis 20&5 %
Beatty's .... dis 40 @ 40&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s .... dis 40 %

Butts.
Brass—
Wrought Brass .... dis 75&10 @ 80 %
Cast Brass, Tiebout's .... dis 40 %
Cast Brass, Corbin's Fast .. dis 33⅓&10@33⅓&10&10 %
Cast Brass, Loose Joint .... dis 33⅓&10@33⅓&10&10 %
Cast Iron—
Fast Joint, Narrow .... dis 50&10&5 %
Fast Joint, Broad .... dis 55&10&5 %
Loose Joint
Loose Joint, Japanned
Loose Joint, Jap. with Acorns
Parliament Butts
Mayer's Hinges
Loose Pin, Acorns
Loose Pin, Acorns, Japanned
Loose Pin, Acorns, Jap, Pltd. Tips } dis 66⅔&10&5@70&10 %
Wrought (Steel)—
Fast Joint Narrow .... dis 65&10&2 %
Fast Joint, Lt. Narrow .... dis 65&10&2 %
Fast Joint, Broad .... dis 65&10&2 %
Loose Joint, Broad .... dis 65&10&2 %
Table Butts, Back Flaps, &c .... dis 65&10&2 %
Inside Blind, Regular .... dis 65&10&2 %
Inside Blind, Light .... dis 65&10&2 %
Loose Pin, Wrt .... dis 65&10&2 %
Loose Pin, Light .... dis 65&10&2 %
Bronzed Wrought Butts .... dis 40&2 %

Calipers.—See Compasses.

Can Openers.
Messenger's Comet .... ℘ doz $3.00, dis 25 %
American .... ℘ gross $3.00
Duplex .... ℘ doz 25¢, dis 15 @ 20 %
Lyman's .... ℘ doz $3.75, dis 20 %
No. 4, French .... ℘ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle .... ℘ gross $6.00, dis 45 @ 50 %
Eureka .... ℘ doz $2.50, dis 10 %
Sardine Scissors .... ℘ doz $7.00, dis 55 %
Star .... ℘ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; 2, ? 3, $2.50 .... dis 50&10&10 %
World's Best, ℘ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00 .... dis 50&10 %
Universal .... ℘ doz $3.00, dis 35&5 %
Domestic .... ℘ doz $2.50, dis 45 %
Champion .... ℘ doz $2.00, dis 50 %

Cards.
Horse and Curry .... dis 10 @ 10&10 %
Cotton .... New list, Aug., 1883, dis 10 %
Wool .... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished .... ℘ doz $8.25
Cast Iron, Steel Points .... ℘ doz 80¢
Socket .... ℘ doz $1.75
Bullard's .... dis 25 @ 25&10 %

Carpet Sweepers.
Bissell No. 5 .... ℘ doz $17.00
Bissell No. 7 New Drop Pan .... ℘ doz $19.00
Bissell No. 12 Hall Sweeper .... ℘ doz $36.00
Grand Rapids .... ℘ doz $27.00
Crown Jewel .... No. 1, $18; No. 2, $19; No. 3, $20
Magic .... ℘ doz $15.00
Jewel .... ℘ doz $17.00
Mystic .... ℘ doz $16.00
Cottage .... ℘ doz $15.00
Garland .... ℘ doz $18.00
Parlor Queen .... ℘ doz $24.00
Housewife's Delight .... ℘ doz $15.00
Queen .... ℘ doz $16.00
Queen, with band .... ℘ doz $18.00
King .... ℘ doz $30.00
Weed Improved .... ℘ doz $18.00
Hub .... ℘ doz $16.00
Cog Wheel .... ℘ doz $16.00
Church .... each $3.00

Cartridges.—See Ammunition.

Casters.
Bed
Plate
Shallow Socket } New list July 8, 1886, dis 50&10 @ 60&5 %
Deep Socket .... 40&10 %
Yale Casters, list May, 1884 .... dis 30&10@40 %
Yale, Gem .... dis 60@60&5 %
Martin's Patent (Phoenix) .... dis 45&10 @ 50 %
Payson's Anti friction .... dis 60 %
"Giant" Truck Casters .... dis 10 @ 10&5 %
Stationary Truck Casters .... dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s .... dis 75 @ 75&10 %
Sargent's .... dis 66⅔&10 %
Hotchkiss .... dis 30 %
Peck, Stow & W. Co .... dis 50&10 %

Chain.
Trace, 6½-10-2, Eng. sizes .... ℘ pair 79¢
Trace, 6½-10-3, Eng. sizes .... ℘ pair 70¢
Trace, 7-10-2, Eng. sizes .... ℘ pair 86¢ } dis 50&5 @ 50&10 %
Log, Fifth, Stretener, and other fancy Chains, list Nov. 1, 1884 .... dis 50&10 @ 50&10&5 %

American Coil	3-16	¼	5-16	⅜	7-16	½	⅝	¾
In cask lots.	9	6.35	5.15	4.6	4.4	4.2	4.0	3.9

Less than cask lots, add ¼¢@½¢ ℘ ℔.
German Coil, list of June, 1881 .... dis 55&5@60 %
German Halter Chain, list of June, 1884, dis 55&5@60 %
Covert Halter, Hitching and Breast .... dis 50&2 %
Covert Traces .... dis 35@2 %
Oneida Halter Chain (old list) .... dis 45 %
Galvanized Pump Chain .... ℘ ℔ 5¼¢ @ 5¾¢
Jack Chain, Iron .... dis 75&10 @ 75&10&5 %
Jack Chain, Brass .... dis 75 @ 75&10 %

Chalk.
White .... ℘ gro 55¢
Red .... ℘ gro 75¢
Blue .... ℘ gro 90¢
White Crayons .... ℘ gro 12¢ @ 12½¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
Witherby and Douglas
P., S. & W.
New Haven and Middlesex } dis 75 @ 75&5 %
Buck Bros .... dis 30 %
Merrill .... dis 60&10&10 %
L. & I. J. White .... dis 30 @ 30&5 %
Tanged Firmers .... dis 50 @ 50&5 %
Tanged Firmers, Butcher's .... $4.75 @ $5.00
Tanged Firmers, Spear & Jackson's .... $5.00 to £
Tanged Firmers, Buck Bros .... dis 30 %
Cold Chisels, ℘ ℔ .... 16¢ @ 19¢

Chucks.
Beach Patent .... each, $8.00, dis 20 %
Morse's Adjustable .... each, $7.00, dis 20 @ 20&5 %
Danbury .... each, $6.00, dis 30 @ 30&5 %
Syracuse, Balz Pat. .... dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron .... dis 25 %
Adjustable, Gray's .... dis 20 %
Adjustable, Lambert's .... dis 20 %
Adjustable, Snow's .... dis 40&5 %
Adjustable, Hammer's .... dis 15 %
Adjustable, Stearns' .... dis 20&10 %
Stearns' Adjustable Cabinet and Corner .. dis 20&10 %
Cabinet, Sargent's .... dis 66⅔&10 %
Carriage Makers', Sargent's .... dis 66⅔&10 %
Ebernard Mfg. Co .... dis 40&5 @ 40&10 %
Warner's .... dis 40&10 @ 40&10&5 %
Saw Clamps .... See Vises

Clips.
Norway, Axle, ¼ & 5-16 .... dis 55&5&5
Second grade Norway Axle, ¼ & 5-16 .... dis 65&5
Superior Axle Clips .... dis 66⅔&5 @ 66⅔&5&5 %
Norway Spring Bar Clips, 5-16 .... dis 60&5&5
Wrought-Iron Felloe Clips .... ℘ ℔ 5½¢
Steel Felloe Clips .... ℘ ℔ 5¢

Cockeyes .... dis 50 %

Cocks, Brass.
Hardware list .... dis 55&2 %

Coffee Mills.
Board and Box .... dis 40&10&2 %
Selsor's Patent .... $9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co. .... dis 20&10@30 %
The "Swift," Lane Bros .... dis 20&10 %
Webb's Patent .... dis 45 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers .... dis 70@70&10 %
Bemis & Call Co.'s Dividers .... dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers .... dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside. dis 50&5 %
Bemis & Call Co.'s Double .... dis 60 %
Bemis & Call Co.'s (Call's Patent Inside) .... dis 30 %
Excelsior .... dis 50 %
Cook's Extension .... dis 25 @ 25&10 %
J. Stevens & Co.'s Calipers and Dividers .... dis 25&10 %

Coopers' Tools.
Bradley's .... dis 20 %
Barton's .... dis 20@20&5 %
L. & I. J. White .... dis 20&5 %
Albertson Mfg. Co. .... dis 25 %
Beatty's .... dis 40 @ 40&5 %
Sandusky Tool Co .... dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co. .... dis 40 @ 40&10 %
Clough's Patent .... dis 33⅓ @ 33⅓&5 %
Howe Pros. & Hulbert .... dis 35 %

Corn Knives and Cutters.
Bradley's .... dis 10 %
Wadsworth's .... dis 25 %

Cradles.—Grain .... dis 40&10@50 %

Crow Bars.
Cast Steel .... ℘ ℔ 4¢
Iron, Steel Points .... ℘ ℔ 3½¢

Curry Combs.
Fitch's .... dis 50&10 @ 50&10&10 %
Rubber .... ℘ doz $10.00, dis 25 @ 30 %
Perfect .... dis 50 %

Curtain Pins.
Silvered Glass .... net
White Enamel .... net

Cutlery.
Beaver Falls and Booth's .... dis 33⅓ %
Wostenholme .... $7.75 to £

Dampers, &c.
Dampers and Clips, Buffalo .... dis 40 %
Dividers—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list .... dis 30&10 %
Leather, Pope & Stevens' list .... dis 40 %
Brass, Pope & Stevens' list .... dis 40 %

Door Springs.
Torrey's Rod, regular size .... ℘ doz $1.30
Gray's .... ℘ gro, $20.00, dis 20 %
Bee Rod .... ℘ gro, $20.00, dis 20 %
Warner's No. 1, ℘ doz, $2.50; No. 2, $3.30, dis 40&10@50 %
Gem (Coil), list April 19, 1886 .... dis 10 %
Star (Coil), list April 19, 1886 .... dis 20 %
Victor (Coil) .... dis 60 @ 60&10 %
Champion (Coil) .... dis 60&10 @ 60&10&10 %
Philadelphia .... 5 in., $5.00; 8 in., $7.75, dis 35 %
Cowell's .... No. 1, ℘ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete .... ℘ doz $4.50, dis 55&10 %
Hercules .... dis 50 %
Shaw Door Check and Spring .... dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring .... dis 25 %

Drawing Knives.
Witherby and Douglas
P., S. & W.
New Haven and Middlesex } dis 75 @ 75&5 %
Merrill .... dis 60&10&10 %
Watrous .... dis 15&10 @ 25 %
L. & I. J. White .... dis 20&5 %
Bradley's .... dis 35 %
Adjustable Handle .... dis 20 @ 25 %
Wilkinson's Folding .... dis 25 @ 25&5 %

Drills and Drill Stocks.
Blacksmiths' .... each, $1.60 @ $1.65
Blacksmiths' Self-Feeding .... each, $7.50, dis 20 %
Breast, P. S. & W .... dis 40&10 %
Breast, Wilson's .... dis 30&5 %
Breast, Millers Falls .... each, $3.00 dis 25 @ 25&10 %
Breast, Bartholomew's .... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's .... dis 20 @ 20 & 5 %
Ratchet, Ingersoll's .... dis 25 %
Ratchet, Parker's .... dis 20 @ 20&5 %
Ratchet, Whitney's .... dis 20&10 %
Ratchet, Weston's .... dis 20@25 %
Ratchet, Moore's Triple Action .... dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00, Adjustable, $12.00 .... dis 20&10 %
Wilson's Drill Stocks .... dis 10 %
Automatic Boring Tools .... each, $1.75 @ $1.85
Twist Drills—
Morse .... dis 50&10 %
Standard .... dis 50&10 %
Syracuse .... dis 50&10 %
Cleveland .... dis 50&10 %
Williams .... dis 50&10&10 %
Drill Bits.—See Augers and Bits.
Drill Chucks.—See Chucks.

Dripping Pans.
Per ℔ .... 6¢ @ 6½¢

Egg Beaters.
Dover .... ℘ doz., $2.50
National .... ℘ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.) .... ℘ gro, $17.00@$18.00
Standard (Standard Co.) .... ℘ gro, $10.00
Kingston (Standard Co.) .... ℘ gro, $7.50
Acme (Standard Co.) .... ℘ gro, $7.50
Duplex (Standard Co.) .... ℘ gro, $12.00
Rapid (Standard Co.) .... ℘ gro, $15.00
Triumph (T. & S. Mfg. Co.) .... ℘ gro, $10.50@$11.50
Advance No. 1 .... ℘ gro $10.50
Advance, No. 2 .... ℘ gro $10.00
Bryant's .... ℘ doz $2.00
Ayres' Spiral .... ℘ gro $5

Electric Bell Sets.—Wollensak's .... dis 20 %

Emery.	No. 4 to 40 gr.	No. 54 to 150 gr.	Flour, CF F FF.
Kegs, ℘ ℔	4 ¢	4½¢	2¾¢
½ kegs, ℘ ℔	4¼¢	4¾¢	3 ¢
¼ kegs, ℘ ℔	4½¢	5 ¢	3¼¢
10 ℔ cans, 10 in case	6 ¢	6 ¢	5 ¢
10 ℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron, list Nov. 11, 1885 .... dis 50&10 @ 50&10&5
Brass .... dis 65 @ 65&5 %

Escutcheons.
Door Lock .... Same discounts as Door Locks
Brass Thread .... dis 60 @ 60&10 %
Wood .... dis 25 %

Faucets.
Fenn's .... dis 40 %
Bohren's Patent Rubber Ball .... dis 25 %
Fenn's Cork Stops .... dis 33⅓ %
Star .... dis 60 @ 60&5 %
Frary's Patent Petroleum .... dis 40&10&2 %
West's Patent Key .... dis 50&10 %
Anchor Lock .... dis 45 %
Metallic Key, Leather Lined .... dis 55&10 @ 60&10 %
Cork Lined .... dis 70 @ 70&10 %
Burnside's Red Cedar .... dis 50 %
Burnside's Red Cedar, bbl. lots .... dis 50&10 %
J. Sommer's Best Block Tin Key .... dis 40 %
J. Sommer's Cork Lined, 1st quality .... dis 50 %
J. Sommer's Diamond Lock .... dis 40 %
Self-Measuring, Enterprise .... ℘ doz $36.00—dis 20&10 %
Self-Measuring, Lane's .... ℘ doz $36.00—dis 25&10 %
Self-Measuring, Victor .... ℘ doz $36.00—dis 25&10 %

Felloe Plates .... ℘ ℔ 6 @ 6½¢

Fifth Wheels.—Derby and Cincinnati .dis 45&5 %

Files.
Domestic—
Best brands .... dis 60&10 @ 60&10&5 %
Good brands .... dis 60&10&5 @ 60&10&10&5 %
Fair brands .... dis 70 @ 70&10 %
Heller's Horse Rasps .... dis 50&10 %
Imported—
J. & Riley Carr .... List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps .... dis 10 %
Moss & Gamble .... List April 1, 1883, dis 15 %
Butcher .... Butcher's list, dis 20 %
Stubs .... Stubs list, dis 25 @ 30 %
Turton's .... Turton's list dis. 20 @ 25 %
Greaves' Horse Rasps .... American list, dis. 60 %

Fluting Machines.
Knox, 4½-inch Rolls .... $3.25 each
Knox, 6-inch Rolls .... $3.60 each } dis 35 %
Eagle, 3½-inch Roll .... $2.15, dis 35 %
Eagle, 5½-inch Roll .... 2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in., $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel .... 6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter .... $1.50 each, net
Geneva Hand Fluter, White Metal .. ℘ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10, dis 30 %
Shepard Hand Fluter, No. 85 .... ℘ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110 .... ℘ doz $11, dis 40 %
Shepard Hand Fluter, No. 95 .... ℘ doz $8, dis 40 %
Clark's Hand Fluter .... ℘ doz $15.00, dis 35 %
Combined Fluter and Sad Iron .... ℘ doz $15.00, dis 30 %
Buffalo .... ℘ doz $10.00 dis 10 %

Fluting Scissors .... dis 45 %

Fly Traps.
Paragon, Champion, &c .... ℘ doz $1.75

Forks.—Hay, Manure, &c., Asso. list. dis 60&10&10 %
Hay, Manure, &c., Phila. list .... dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice-Cream.
Leading Goods .... dis 60&2 @ 60&10 %

Fruit and Jelly Presses.
Enterprise Mfg. Co. .... dis 20&10 @ 30 %
Henis .... ℘ doz $4.50

Fry Pans.
Association List .... dis 65&10 %

No.	0	1	2	3	4	5	6	7	8
℘ doz	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

Gauges.
Marking Mortise, &c .... dis 60&10 %
Wire, low list .... dis 10&10 %
Wire, Wheeler, Madden & Co. .... dis 10 %
Wire, Morse's .... dis 50 @ 50&5 %
Wire, Brown & Sharpe's .... dis 10 @ 20 %

Gimlets.—Nail and Spike .... dis 50&10&5 %
"Eureka" Gimlets .... dis 40&10 %
"Diamond" Gimlets .... dis 40&10 %
Double Cut, Shepardson's .... dis 45 @ 45&5 %
Double Cut, Ives' .... dis 50&10@60 %
Double Cut, Douglass' .... dis 40&10 %
"Bee" .... ℘ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled .... dis 30@35 %
Family, Howe's "Eureka" .... dis 40 %
Family, L. F. & C.'s "Handy" .... dis 50 %

Grindstone Fixtures.
Sargent's Patent .... dis 70&10 %
Reading Hardware Co. .... dis 25&10 @ 25&10&10 %

Hack Saws.—See Saws.

Halters.—Covert's Pat. ½ Jute .... dis 50&2 %
Covert's Hemp Horse and Cattle Tie .... dis 50&2 %
Covert's Jute Horse and Cattle Ties .... dis 60&10&2 %

Hammers.
Handled Hammers.
Maydole's .... List Dec. 1, 1885, dis 25 @ 25&10 %
Cheney's
Hartford Hammer Co.'s
Buffalo Hammer Co
Yerkes & Plumb
C. Hammond & Son
Humason & Beckley
Atna Tool Co } List Jan. 15, '87, Dis. 40&10 @ 40&10&10 %
Verree .... dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75, dis 30&10 %
Nelson Tool Works .... dis 40&10 %
Warner & Nobles .... dis 20 @ 25 %
Peck, Stow & Wilcox .... dis 40 %
Sargent's .... dis 33⅓&10 %
Heavy Hammers and Sledges—
3 ℔ and under .... ℘ ℔ 40¢
3 to 5 ℔ .... ℘ ℔ 36¢
Over 5 ℔ .... ℘ ℔ 30¢ } dis 60 %
Wilkinson's Smiths' .... 10½¢ @ 11¢ ℘ ℔

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ℘ doz .. dis 10 %
Providence Tool Co., Leg Irons, $25.00 ℘ doz .... dis 10 %
Tower's .... dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ℘ doz, $48; Nickeled, $57; 3 Hands, Polished, ℘ doz, $72; Nickeled, $84 .... dis 20 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.

Nos.	0	1	2	3	4	
Per doz.	$0.90	1.00	1.18	1.35	1.50	dis 60&10&10 %

Roggin's Latches .... ℘ doz. 30¢ @ 35¢
Bronze Iron Drop Latches .... ℘ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88 .... net
Barn Door .... ℘ doz. $1.40, dis 10&10 %
Chest and Lifting .... dis 70 %
Handles, Wood—
Saw and Plane .... dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c .... dis 25&5&2 %
Brad Awl .... ℘ gross $2.00
Hickory Firmer Chisel, assorted .... ℘ gross 4.50
Hickory Firmer Chisel, large .... ℘ gross 5.00
Apple Firmer Chisel, assorted .... ℘ gross 5.00
Apple Firmer Chisel, large .... ℘ gross 6.00
Socket Firmer Chisel, assorted .... ℘ gross 3.00
Socket Framing Chisel, assorted .... ℘ gross 5.00 } dis 40
J. B. Smith Co.'s Pat. File .... dis 50 %
File, assorted .... ℘ gross 2.75
Auger, assorted .... ℘ gross 5.00
Auger, large .... ℘ gross 7.00 } dis 40 @ 40&10 %
Patent Auger, Ives' .... dis 30&10 %
Patent Auger, Douglass' .... ℘ set $1.25 net
Patent Auger, Swan's .... ℘ set $1.00 net
Hoe, Rake, Shovel, &c .... dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ℘ pair, 30¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles .... 50¢, dis 60 %
Champion .... 15¢

Hangers.
Barn Door, old patterns .... dis 60&10&10 @ 70
Barn Door, New England .... dis 60&10&10 @ 70 %
Samson Steel Anti-Friction .... dis 55 %
Orleans Steel .... dis 55 %
Hamilton Wrought Wood Track .... dis 55 %
U. S. Wood Track .... dis 65 %
Champion .... dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list .... dis 70 %
Climax Anti-Friction .... dis 55 %
Climax Steel Anti-Friction .... dis 55 %
Zenith for Wood Track .... dis 50 %
Reed's Steel Arm .... dis 55 %
Challenge, Barn Door .... dis 40 %
Sterling Improved (Anti-Friction) .... dis 50 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18 .... dis 65&10 %
Cheritree .... dis 50&2 %
Kidder's .... dis 50&5 %
The "Boss" .... dis 50&10 @ 60 %
Best Anti-Friction .... dis 60 %
Duplex (Wood Track) .... dis 60 %
Terry's Patent .... ℘ doz. pr.. 3½ in. $10; 5 in. $12 .... dis 50 @ 50&5 %
Cronk's Patent .... No. 4, $12; No. 5, $14.40; No. 6, $18 .... dis 50&10 @ 50&15 %
Wood Track, Iron Clad .. ℘ ft. 10¢, dis 50&10 @ 50&15 %
Architect .... ℘ set $6.00, dis 20 %
Eclipse .... dis 20&10
Felix .... ℘ set $4.50, dis 20 %
Richards' .... dis 30@30&10 %
Lane's Steel Anti-Friction .... dis 40&10 %
The Ball Bearing Door Hanger .... dis 20&10 @ 25&10 %
Warner's Patent .... dis 20@20&10 %
Stearns' Anti-Friction .... dis 20 @ 20&10 %
Stearns' Challenge .... dis 20&10 @ 20&10&10 %
Faultless .... dis 40 @ 40&5 %
American .... ℘ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢ .... dis 40 %
Paragon, Nos. 1, 2 and 3 .... dis 40@40&10 %
Paragon, Nos. 4, 5, 5½ and 6 .... dis 25&5 %
Crescent .... dis 60@60&10 %
Nickel, Cast Iron .... dis 50 %
Nickel, Malleable Iron and Steel .... dis 40 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.
Isaiah Blood .... dis 35 @ 40 %
Hunt's Shingling Lath and Claw .... dis 40&5 %
Hunt's Broad .... dis 40 %
Buffalo Hammer Co .... dis 40&10@50 %
Hurd's .... dis 40&5 @ 40&10&5 %
Yerkes & Plumb .... 40&5 @ 40&10 %
Underhill Edge Tool Co .... dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods .... dis 33⅓ %
C. Hammond & Son .... dis 40&10 @ 50 %
Simmons .... dis 35 @ 40 %
Peck's .... dis 40&10 @ 40&10&5 %
Kelly's .... dis 50@50&5 %
Sargent & Co .... dis 50 %
Ten Eyck Edge Tool Co. .... dis 40&10@40&10&5 %
Collins, following list .... dis 10 %

	Nos.		1	2	3
Shingling	Nos. 1 2 3	℘ doz	$5.50	$6.00	$6.50
Claw	Nos. 1 2 3	℘ doz	6.00	6.50	7.00
Lathing	Nos. 1 2 3	℘ doz	5.50	6.00	6.50

Hay Knives.
Lightning .... ℘ doz $18, dis 25 @ — %
Electric .... ℘ doz $9.50 @ $10.50
Gem .... ℘ doz $12 @ $12.50
Wadsworth's .... dis 40&10 %
Carter's Needle .... ℘ doz $12 @ $13.50

Hinges.
Wrought Iron Hinges—
Strap and T .... dis 70&2 %
Screw Hook and Strap { 8, 10, 12 in., ℘ ℔ .... 4 @ 4¼¢; 14 to 36 in., ℘ ℔ .... 3 @ 3¼¢
Heavy Welded Hook { 8 to 12 in., ℘ ℔ .... 4 @ 4¼¢; 14 in. & up, ℘ ℔ .... 3 @ 3¼¢
Screw Hook and Eye { ⅝ in. .... ℘ doz $1.50; ¾ in. .... ℘ doz $2.45; ⅞ in. .... ℘ doz $3.80 } dis 10 %
Rolled Blind Hinges, Nos. 32 and 34 .... dis 50&10 %
Rolled Blind Hinges, Nos. 232 and 234 .... dis 55&10 %
Rolled Plate .... dis 70&10 %
Rolled Raised .... dis 70&10 %
Plate Hinges "Providence" { 8, 10 & 12 in., ℘ ℔ .... 4½¢; over 12 in., ℘ ℔ .... 3½¢
Spring Hinges—
Geer's Spring and Blank Butts .... dis 40 %
Union Spring Hinge Co.'s list, March, 1886 ... dis 20 %
Acme, Crown, Empire and U. S .... dis 30 %
American, Gem, and Star, Japanned .... dis 20 %
American, Gem, and Star, Bronzed .... net
Oxford, Bronze and Brass .... net
Barker's Double Acting .... dis 20&10 %
Union Mfg. Co .... dis 25 %
Bommer's .... dis 30 %
Buckman's .... dis 30 %
Chicago .... dis 15@20 %
Gate Hinges—
Western .... ℘ doz $4.40, dis 55 %
N. E. .... ℘ doz $7.00, dis 55 %
N. E. Reversible .... ℘ doz $5.20, dis 55&10 %
Clark's, Nos. 1 2 3 .... dis 60&10 @ 60&10&5 %
N. Y. State .... ℘ doz $5.00, dis 55&10 %
Automatic .... ℘ doz $12.50, dis 50 %
Common Sense .... ℘ doz pair $4.50, dis 50 %
Seymour's .... dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20, dis 60&10@60&10&10 %
Shepard's, No. 3 .... dis 60&10@60&10&10 %
Reed's Latch and Hinges .... ℘ doz sets $12, dis 50 %
Blind Hinges—
Parker .... dis 75&2 %
Palmer .... dis 50&5&10 %
Seymour .... dis 70&2 %
Lull & Porter .... dis 75&10@80 %
Nicholson .... dis 45&10 %
Huffer .... dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 50 .... dis 75&10&5 %
Clark's Mortise Gravity .... dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13 .... dis 75&10 %
Sargent's, No. 12 .... dis 75&10&10 %
Reading's Gravity .... dis 75 @ 75&10 %
Shepard's "Noiseless," Nos. 50, 60, 65 & 55 .. dis 75&5 %
Shepard's Niagara Gravity, Nos. 1, 3 and 5 .... dis 75&10&5 %
Shepard's Buffalo Gravity, Nos. 1, 3 and 5 .... dis 75&10&5 %
Shepard's Champion Gravity, No. 75 ... dis 75&10&5 %
Shepard's Steamboat Gravity No. 10 .. dis 75&10&5 %
Shepard's Acme Lull & Porter .... dis 75&5 %
Shepard's O. S. Lull & Porter .... dis 75&10 %
Shepard's "Queen City" Reversible .... dis 70&10 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3 .... dis 75&10&2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50 ... dis 25&2 %

Hoes.
Handled—
Garden, Mortar, &c .... dis 60&10&10 @ 70 %
Planter's, Cotton, &c .... dis 60&10&10 %
Warren Hoe .... dis 60 %
Magic .... ℘ doz $4.75
Eye—
D. & H. Scovil .... dis 15 %
Lane's Crescent Scovil Pattern .... dis 45 %
Lane's Crescent Planters Pattern .... dis 45 & 5 %
Lane's Improved Scovil Pattern .... dis 30 %
Maynard. S. & O. Pat. .... dis 45&5 %
Sandusky Tool Co., " " .... dis 60 %
Hubbard & Co., " " .... dis 60 %
Bare .... dis 60 %
Grub .... dis 60 @ 60&10 %

Hog Rings and Ringers.
Hill's Improved Ringers .... ℘ doz. $5.50 @ 5.75
Hill's Old Style Ringers .... ℘ doz. $3.00 @ 3.25
Hill's Tongs .... ℘ doz. $5.50 @ 6.00
Hill's Rings .... ℘ doz boxes, $2.00 @ 2.25
Perfect Rings .... ℘ doz boxes $1.75 @ 2.00
Perfect Ringers .... ℘ doz $2.50
Blair's Hog Ringers .... ℘ doz, $2.60
Blair's Hog Rings .... ℘ doz, 95¢ @ $1.00
Champion Ringers .... ℘ doz $2.00
Champion Rings, Double .... ℘ doz $2.25
Brown's Ringers .... ℘ doz $2.00
Brown's Rings .... ℘ doz, $1.25 @ 1.30

Hoisting Apparatus.
"Moore's" Hand Hoist, with Lock Brake .... dis 15 %
"Moore's" Differential Pulley Block .... dis 20 %

Holders, Tool.
Balz Pat .... ℘ doz $4; dis 25 %

Hollow-Ware.
Iron—
Stove Hollow-Ware, Ground. dis. 60&10 @ 60 & 10 &5 %
Stove Hollow-Ware, Unground .... dis. 70 @ 70 & 5 %
Enameled and Tinned Hollow-Ware—
Kettles .... dis 50&10 %
Oval Boilers, Saucepans and Glue Pots dis 30 @ 35 %
Gray Enameled Ware .... dis 40 @ 40&5 %
Agate and Granite Ware .... dis 25 %
Rustless Hollow-Ware .... dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Silver Plated—
Reed & Barton
Meriden Brittania Co .... dis 40&5 %
Simpson, Hall, Miller & Co .... dis 40&5 %
Rogers & Brother .... dis 40&5 %
Hartford Silver Plate Co .... dis 40&5 %
William Rogers Mfg. Co .... dis 50&5 %

Hooks.
Cast Iron—
Bird Cage, Sargent's list .... dis 60&10&10 %
Bird Cage, Reading .... dis 60&10&10 %
Clothes Line, Sargent's list .... dis 60&10 %
Clothes Line, Reading list .. dis 60&10 @ 60&10&10 %
Ceiling, Sargent's list .... dis 55&10 %
Harness, Reading list .... dis 55&10 @ 55&10&10 %
Coat and Hat, Sargent's list .... dis 55&10 %
Coat and Hat, Reading .... dis 50&10 @ 50&10&10 %
Wrought Iron—
Cotton .... ℘ doz $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks) .... dis 30 %
Tassel and Picture (T. & S. Mfg. Co.) .... dis 50 %
Wrought Staples, Hooks, &c .... See Wrought Goods
Bench Hooks .... See Bench Stops
Wire—
Wire Coat and Hat, Gem, list April, 1886 .... dis 45 %
Wire Coat and Hat, Miles', list April, 1886 .... dis 45 %
Indestructible Coat and Hat .... dis. 45 %
Belt .... dis 75&10 @ 80 %
Grass .... ℘ doz $2.00
Bush .... dis 55 @ 60 %
Whiffletree—Patent .... dis 55 %
Hooks and Eyes—Malleable Iron .... dis 70 %
Hooks and Eyes—Brass .... dis 60&10 %
Fish Hooks, American .... dis 50 %

Horse Nails.

	6	7	8	9	10	
Ausable	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Clinton, Fin.	24¢	22¢	21¢	20¢	19¢	dis 40&10 %
Essex	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Putnam	24¢	22¢	21¢	20¢	19¢	dis 5&7 @ 5&7&5 %
Vulcan	23¢	21¢	20¢	19¢	18¢	dis 12½&5 %
Northwest'n	25¢	23¢	22¢	21¢	20¢	dis 10&10 @ 20&10 %
Globe	23¢	21¢	20¢	19¢	18¢	dis 12½&5&2½ %
A. C.	25¢	23¢	22¢	21¢	20¢	dis 25&5 @ 25&10 %
C. B.-K.	25¢	23¢	22¢	21¢	20¢	dis 25&5 @ 25&10 %
Champlain	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
New Haven	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Saranac	23¢	21¢	20¢	19¢	18¢	dis 30&5 %
Champion	25¢	23¢	22¢	21¢	20¢	dis 10&10&10 %
Capewell	28¢	26¢	25¢	24¢	23¢	dis 35&5 @ 35&10 %
Star	23¢	21¢	20¢	19¢	18¢	dis 10&10@10&12½ %

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition .... 75&10 @ 80
Standard .... dis 75 %
Extra .... dis 60&10&10 %
N. Y. B. & P. Co., Standard .... dis 60 %
N. Y. B. & P. Co., Dundee .... dis 70&5 %

Ice Picks, Chisels, &c.
Am. Ice Chisel Pol'd .... ℘ doz $3.00, dis 20@20&5 %
National Ice Chisel .... ℘ doz $6.25, dis 20 %
Novelty Ice Breakers .... ℘ doz $6.25, dis 20 %
Dunlap's Ring Picks .... ℘ doz $2.00, dis 15 %
Wood Head Picks Sargent's .... ℘ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's .... ℘ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle .... ℘ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall .... ℘ doz $1.25, dis 20&10 %
Combination Ice Tools .... ℘ doz $2.00 net
Acme Ice Pick and Tongs .... ℘ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel .... ℘ gross $28.50

Ice Cream Freezers.—See Freezers.

Ice Tongs.
Champion, S. S. & Co .... ℘ doz $4.00, dis 25&10 %
Family .... ℘ doz $2.75, dis 20@25 %

Jack Screws.—See Screws.

Kettles.

	Spun.	Stamped.
Brass, 7 to 17 in., ℘ ℔	20¢	18½¢
Brass larger than 17 inches, ℘ ℔		20¢

Enameled and Tea Kettles .... See *Hollow Ware*

Keys.
Lock Asso'n list Dec. 30, 1886 .... dis 50&10&2 %
Eagle, Cabinet, Trunk and Padlock .... dis 33⅓&2 %
Hotchkiss' Brass Blanks .... dis 40 %
Hotchkiss' Copper and Tinned .... dis 40 %
Hotchkiss' Padlock and Cabinet .... dis 35 %
Ratchet Bed Keys .... ℘ doz $4.00, dis 15 %

Knife Sharpeners.
Parkin's Applewood Handles .... ℘ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo .... ℘ doz $9.00, dis 40 %

Knives.
Wilson's Butcher Knives .... dis 25 @ 30 %
Ames' Butcher Knives .... dis 25 %
Nichols' Butcher Knives .... dis 40&10
Ames' Shoe Knives .... dis 20@25 %
Ames' Bread Knives .... ℘ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives .... dis 20 %
Goodell Co., Butcher, Shoe, Bread, &c .... dis 25@33⅓ %
Hay and Straw .... See Hay Knives
Table and Pocket .... See Cutlery

Knobs.
Door Mineral .... 70¢
Door Por. Jap'd .... 85¢
Door Por. Por .... $3.00 @ 3.25
Door Por. Plated .... $2.90 @ 3.00
Hemacite Door Knobs, new list .... dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885 .... dis 40 %
Furniture Plain .... 75¢ gross inch, dis 10 %
Furniture, Wood Screws .... dis 25&10 %
Base, Rubber Tip .... dis 70&10&5 %
Picture, Judd's .... dis 60&10&10 @ 70 %
Picture, Sargent's .... dis 66⅔&10 %
Picture, Hemacite .... dis 35&5 %
Shutter, Porcelain .... dis 65&10 %
Carriage, Japanned .... ℘ gross 80¢, dis 60&10 %

Ladles.
Melting, Sargent's .... dis 55&10
Melting, Reading .... dis 35&10 %
Melting, Monroe's Patent .... ℘ doz. $4.00, dis 40 %
Melting, P. S. & W .... dis 35&10 @ 40 %
Melting, Warner's .... dis 30 %

Lanterns.
Tubular, No. 9, without Guards .... ℘ doz $5.75
Tubular, Liftwire, No. 0, without Guards ℘ doz $8.50
Tubular, Hinge Tip No. 0, without Guards, ℘ doz $6.25
Tubular, Bottom Lift, without Guards .... ℘ doz $6.25
Tubular, U. S. Safety Lift Wire, no Guards, ℘ doz $5.00
Guards for Tubulars, add ℘ doz ....
Police, Small, $6.00; Med. $7.25; Large, $9.75, dis 20@25
Porter's Tin R. R. .... $10 dis %

Lawn Mowers Standard Machines....dis 50&5 %
Cheaper Machines....dis 50&10 @ 60 %

Lemon Squeezers.
Porcelain Lined, No. 1.... ⅌ doz. $6.00, dis 25&30 %
Wood, No. 2.... ⅌ doz. $3.00, dis 35 %
Wood, Common.... ⅌ doz $1.70 @ 1.75
Dunlap's Improved.... ⅌ doz. $3.75, dis 20 %
Sammis'....No. 1, $5; 2, $9; 12, $18 ⅌ doz. ,dis 25&10 %
Jennings' "Star".... ⅌ doz $2.50
The "Boss".... ⅌ doz $2.50
Dean's....Nos. 1, ⅌ doz $6.50; 2, $3.35; 3, $1.90
Little Giant....dis 50 @ 50&5 %
King....dis 40&5 %

Lines.
Cotton and Linen Fish, Draper's....dis 50 %
Draper's Chalk....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..dis 25 %
Cotton Chalk....dis 55 %
Samson Cotton, No. 4, $2; No 4½, $2.50....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00 No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ⅌ gross....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton....dis 45
Wire Clothes, No. 18, $3.75; No 19, $3.25; No. 20, $2.75
Ventilator Cord, Samson Braided, White or Drab Cotton.... $7.50 ⅌ doz. dis 20

Locks, Padlocks, Cabinet Locks, &c.
Door Locks, Latches, &c.—
List Dec. 30,'86, chgd Feb. 2,'87..dis 50&10 @ 55&10 %
Reading Hardware Co. (list Jan. 1,'86).dis 70 @ 70&10 %
Livingston & Co....dis 70 %
Perkins' Burglar Proof....dis 60&25 %
Plate....dis 33⅓&2 %
F. Many's "Extension Cylinder"....$10.50 ⅌ doz
Barnes Mfg. Co....dis 40 %
Yale Flat Key....dis 33⅓ %
Dietz Flat Key....dis 30 %
L. & C. Round Key Latches....dis 30&10 %
L. & C. Flat Key Latches....dis 33⅓&10 %
Romer's Night Latches....dis 20 %
Yale new list....dis 33⅓ %
"Shepardson" or "U. S."....dis 35 %
"Felter" or "American"....dis 40&10 %
Seed's N. Y. Hasp Lock....dis 25 %
Closet—
Eagle, Saylord Parker and Corbin.... List March, '84, revised Jan. 1, '85, dis 33⅓&2 %
Deitz, Nos. 35 to 39....dis 40 %
Deitz, Nos. 51 to 65....dis 40 &10 %
Dietz, Nos. 86 to 90....dis 30 %
Stoddard Lock Co....dis 30 @ 33⅓ %
"Champion" Night Latches....dis 40 %
Barnes Mfg. Co....dis 40 %
Eagle and Corbin Trunk....dis 25&2 %
"Champion" Cabinet and Combination....dis 33⅓ %
Yale....dis 33⅓ %
Romer's....dis 25 %
Padlocks—
List, Dec. 23, '84....dis 66⅔&10&2 @ 66⅔&10&5&2 %
Yale Lock Mfg. Co.'s....dis 33⅓ %
Eagle....dis 25&2 %
Eureka, Eagle Lock Co....dis 40&2 %
Romer's, Nos. 0 to 91....dis 35 %
Romer's, Nos. 200 to 505....dis 20 %
A. E. Dietz....dis 40 %
"Champion" Padlocks....dis 40 %
Hotchkiss....dis 30 %
"Star"....dis 45 %
"Horse Shoe," ⅌ doz., $9....dis 40 %
Barnes Mfg. Co....dis 40 %
Noek's....dis 30 %
Brown's Patent....dis 25 %
Scandinavian....dis 90 %
Fraim's Pat. Scandinavian, new list (low)....dis 60 %

Lumber Tools.
Ring Peavies, "Blue Line" Finish.... ⅌ doz $20.00
Ring Peaves, Common Finish.... ⅌ doz $18.00
Steel Socket Peavies.... ⅌ doz $21.00
Mall. Iron Socket Peavies.... ⅌ doz $19.00
Cant Hooks, "Blue Line" Finish.... ⅌ doz $16.00
Cant Hooks, Common Finish.... ⅌ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.... ⅌ doz $16.00
Cant Hooks, Mall. Socket Clasp Common Finish.... ⅌ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ⅌ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.. ⅌ doz $12.00
Hand Spikes.... ⅌ doz 6 ft., $15.00; 8 ft., $20

	12 ft.	14 ft.	16 ft	18 ft.	20 ft,
Pike Poles, Pike & Hook, ⅌ doz.	$11.50	12.50	14.50	17.50	21.50
Pike Poles, Pike only, ⅌ doz.	10.00	11.00	13.00	16.00	20.00
Pike Poles not ironed, ⅌ doz.	6.00	7.00	9.00	12.00	16.00
Setting Poles, ⅌ doz.	14.00	15.00	17.00	....	....

Swamp Hooks.... ⅌ doz $18.00
Landing Blocks.... ⅌ doz $22.50
Skidding Tongs.... ⅌ doz $51.00
Log Binders.... ⅌ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks....dis 40 %
Chain Rafting Dogs.... ⅌ 100 $12.50
Ring Rafting Dogs... ⅌ 100, med., $10.00; large, $12.00
Timber Grapples.... ⅌ doz $30.00

Lustro.
Four-ounce Bottles.... ⅌ doz. $1.75 ⅌ gro. $17.00 net

Mallets.
Hickory....dis 20&10@20&10&10 %
Lignumvitæ....dis 20&10@20&10&10 %
Penfield Block Co., Hickory and L. V. dis 30 @ 30&10 %

Mattocks.—Regular list....dis 60&5 @ 60&10 %

Meat Cutters
Dixon's—Nos. 1 2 3 4
⅌ doz....$14.00 17.00 19.00 50.00—dis 45 %
Woodruff's....Nos. 100 150
⅌ doz $15.00 18.00—dis 45 %
Champion....Nos. 200 300 400
⅌ doz. $22.00 27.00 40.00—dis 45 %
Hales' Pattern Nos. 11 12 13
⅌ doz...$27.00 33.00 45.00 { dis 70&5@70 & 10 %
American....dis 30 %
Nos.... 1 2 3 4B
Each....$5.00 7.00 10.00 25.00 50.00 60.00
Enterprise....dis 30 %
Nos.... 10 12 22 32 42
Each....$3.00 2.50 4.00 6.00 15.00
Pennsylvania....dis 40&10 %
Nos.... 1 2 3 00
⅌ doz....$24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
⅌ doz..$22.00 30.00 40.00—dis 45@45&10 %
Home No. 1.... $32 ⅌ doz, dis 66⅔&10 %
Kieser's No. 55.... $40 ⅌ doz, dis 40 @ 40&10 %
Kieser's Gem.... $25 ⅌ doz, dis 40 @ 40&10 %
Kieser's Monarch.... $45 ⅌ doz, dis 40 @ 40&10 %
Kieser's Butcher.... $40 each, dis 20 @ 20&5 %
Draw Cut..Nos.. 5 2 6 8
Each....$50.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)....dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.... ⅌ doz, $66.00

Mincing Knives.
Am. (2d quality), ⅌ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18....net
Lothrop's....dis 20&10 %
Smith's, ⅌ doz, Single, $2.00; Double, $3....dis 40@45 %
Knapp & Cowles....dis 50&10@60 %

Molasses Gates.—Stebbins' Pat....dis 70@70&10 %
Stebbins' Genuine....dis 66⅔&10 %
Stebbins' Tinned Ends....dis 40&10 %
Chase's Hard Metal....dis 50&10 %
Bush's....dis 20 %
Lincoln's Pattern....dis 66⅔&10 %
Weed's....dis 20&10 %
Hoss Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00, ⅌ doz, dis 60&10&10 %

Money Drawers.—⅌ doz., $18 @ $20.

Muzzles.—Safety, ⅌ doz. $3....dis 25 %

Nails....See Trade Report
Wire Nails, list April 13, '86....dis 50&10 @60 %
Wire Nails, Standard Penny.... ⅌ keg, $3.20 @ 3.35
Wire Carpet Nails....See Tacks

Nail Puller.—Curtiss Hammer.... ⅌ doz $9.00 net
Giant, No. 1.... ⅌ doz $30.00, dis 10 %
Pelican.... ⅌ doz $9.00, dis 25 %
Boss.... ⅌ doz $36, dis 30 %

Nail Sets.—Square.... ⅌ gro. $4.00 @ $4.25
Round.... ⅌ gro., $3.25

Nut Crackers.
Cable (Humason & Beckley Mfg. Co.)....dis 40 %
Blake's Pattern.... ⅌ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co....dis 50 %

Nuts and Washers.

Size of bolt, in.	¼	5-16	⅜	½	⅝	¾	1
Square	8¼	7.3	5.8	4.9	4.3	4	3.6
Hexagon	21	12	8¾	6¼	5¼	5¼	4¾
Washers	7¾	6½	5⅛	4½	4	4	4

In lots less than 100 ℔, ⅌ ℔, add ½¢, 1 ℔ boxes add 1¢ to list.

Oakum
Government.... ⅌ ℔ 6½¢
U. S. Navy.... ⅌ ℔ 6 ¢
Navy.... ⅌ ℔ 5½¢

Oilers.—Zinc and Tin....dis 65&10@70 %
Brass and Copper....dis 50&10@50&10&5 %
Malleable, Hammers' Improved, No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ⅌ doz....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list....dis 40 %
Prior's Patent or "Paragon" Zinc....dis 60&10&10 %
Prior's Patent or "Paragon" Brass....dis 50 %
Olmstead's Tin and Zinc....dis 60 %
Olmstead's Brass and Copper....dis 50 %
Broughton's Zinc....dis 60 %
Broughton's Brass....dis 50 %

Packing, Steam.
Rubber—
Standard....dis 60&10 @ 60&10&5 %
Extra....dis 50&10 @ 50&10&5 %
N. Y. Belting & Packing Co., Standard....dis 60 %
N. Y. B. & P. Co., Dundee....dis 70&5 %
N. Y. B. & P. Co., Salamander.... ⅌ ℔ 65¢, dis 35 %
Jenkins' Standard.... ⅌ ℔ 80¢, dis 35 %
Miscellaneous—
American Packing....10¢ @ 11¢ ⅌ ℔
Russia Packing....14¢ ⅌ ℔
Italian Packing....13 @ 14¢ ⅌ ℔
Cotton Packing....15 @ 17¢ ⅌ ℔
Jute....7 @ 8¢ ⅌ ℔

Padlocks.—See Locks.

Pails, Galvanized Water.

Quarts	10	12	14
Hill's Light Weight, ⅌ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ⅌ doz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shepard & Co.	26.7	....	3.23
Iron Clad	3.50	....	4.00
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Pencils Faber's Carpenters'....high list, dis 50 %
Faber's Round Gilt.... ⅌ gro $5.25 net
Dixon's Lead.... ⅌ gro $4.50 net
Dixon's Lumber.... ⅌ gro $6.75 net
Dixon's Carpenters'....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13..dis 60&5 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13..dis 60&5 @ 60&10 %

Picture Nails.
Brass Head, Sargent's list....dis 50&10&10 %
Brass Head, Combination list....dis 50&10 %
Porcelain Head, Sargent's list....dis 50&10&10 %
Porcelain Head, Combination list....dis 40&10 %
Niles' Patent....dis 40 %

Pinking Irons.... ⅌ doz 65¢ net

Pipe, Wrought Iron.—List March 23, 1887
1¼ and under, Plain....dis 32½ %
1¼ and under, Galvanized....dis 22½ %
1½ and over, Plain....dis 50 %
1½ and over, Galvanized....dis 37½ %
Boiler Tubes....dis 42½ %

Planes and Plane Irons
Wood Planes—
Molding....dis 40 @ 40&5 %
Bench, First Quality....dis 50&5 %
Bench, Second Quality....dis 50&10 @ 60 %
Bailey's (Stanley R. & L. Co.)....dis 30&10 %
Iron Planes—
Bailey's (Stanley R. & L. Co.)....dis 30&10 %
Miscellaneous Planes (Stanley R. & L. Co.)dis 20&10 %
Victor Planes (Stanley R. & L. Co.)....dis 20&10 %
Steer's Iron Planes....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s Iron Planes....dis 30&10 %
Davis's Iron Planes....dis 30&10 %
Birmingham Plane Co....dis 40 %
Plane Irons—
Plane Irons....dis 20&10 %
Plane Irons, Butcher's....$5.00 @ $5.25 to £
Plane Irons, Buck Bros....dis 30 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron," Single and Cut....dis 20 @ 25 %
Double....dis 33⅓ @ 40 %
L. & I. J. White....dis 25 %

Pliers and Nippers.
Button's Patent....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $18.50; No. 4, 7 in., $21.00 ⅌ doz dis 20&10@33⅓ %
Humason & Beckley Mfg. Co....dis 50 @50&10 %
Gas Pliers....dis 60 %
Gas Pliers, Custer's Nickel Plated....dis 60&5 %
Eureka Pliers and Nippers....dis 40 %
Russell's Parallel....dis 25 %
P. S. & W. Cast Steel....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters....dis 20 %
Morrill's Parallel, per doz., $12....dis 30&5 %
Cronk's 8 in., $15; 10 in., $21....dis 10 %

Plumbs and Levels.
Regular List....dis 70&10@70&10&10 %
Disston's....dis 45&10 %
Pocket Levels....dis 70&10@70&10&10 %
Davis Iron Levels....dis 30 %
Davis' Inclinometers....dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt.... ⅌ gro $14.56 @ $15
Round or Square, 2 qt.... ⅌ gro $25 @ $26

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.... ⅌ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.... ⅌ doz $36.00, dis 20 %
Eureka Diggers.... ⅌ doz $16 @ $17
Leed's.... ⅌ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz, $24.00....dis 40 %
Kohler's Little Giant.... ⅌ doz $18.00
Kohler's Hercules.... ⅌ doz $16.00
Kohler's New Champion.... ⅌ doz $9.00
Schneidler.... ⅌ doz $16 @ $17
Ryan's Post Hole Diggers.... ⅌ doz $24
Cronk's Post Bars.... ⅌ doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ⅌ doz $30. dis 10 @ 10&10 %

Potato Parers.
White Mountain.... ⅌ doz $5.00 @ 5.50
Antrim Combination.... ⅌ doz $8.00
Hoosier.... ⅌ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw ⅌ doz $18.00....dis 20&10 %
Disston's Pruning Hook.... ⅌ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools....dis 40 %
Pruning Shears, Henry Pat.... ⅌ doz $3.75 @ $4.00 net
Henry's Pruning Shears.... ⅌ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination.... ⅌ doz $12, dis 20 %
Dunlap's Saw and Chisel.... ⅌ doz $8.50, dis 30 %
J. Mallinson & Co....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c....dis 60&10 %
Japanned Screw....dis 60&10 %
Brass Screw....dis 60&10 %
Japanned Side....dis 66⅔&10 %
Japanned Clothes Line....dis 60&10 %
Empire Sash Pulley....dis 55 @ 60 %
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 { dis 50&10 @ 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70....dis 50 %
Hay Fork, "F" Common and Pat. Bushed....dis 20 %
Hay Fork, Tarbox Pat. Iron....dis 20 %
Hay Fork, Reed's Self-Lubricating....dis 60 %
Shade Rack....dis 45 %
Tackle Blocks....See Blocks

Pumps.—Cistern, Best Makers....dis 50 @ 10&60 %
Pitcher Spout, Best Makers....dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.... ⅌ doz 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive....dis 50&5 %
Bemis & Call Co.'s Springfield Socket....dis 50&5 %
Spring, good quality.... ⅌ doz $2.50 @ $2.60
Spring, Leach's Patent....dis 15 %
Bemis & Call Co.'s Spring and Check....dis 40 %
Solid Tinners'.... ⅌ doz $1.44, dis 55 %
Tinners' Hollow Punches....dis 20&2 %

Rail.
Sliding Door, Wrought Brass ⅌ ℔ 35¢, dis 20@25 %
Sliding Door, Bronzed Wrt. Iron.... ⅌ foot 7¢
Sliding Door Iron, Painted.... ⅌ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ½ ⅝ ¾
Per 100 feet.... $2.50 3.00 4.40—dis 10 %
B. D. for N. E. Hangers— Small. Med. Large
Per 100 feet.... $2.15 2.70 3.25 net
Terry's Wrought Iron, ⅌ foot.... 4¾¢ @ 5¢
Victor Track Rail, 7¢ ⅌ foot....dis 50&2 %

Rakes.
Cast Steel....dis 60&10&10 @ 70 %
Malleable....dis 60&10&10 @ 70 %
Piqua Handle and Mfg. Co....dis 70&5 @ 70&10 %
Gibbs Lawn Rake....$12, dis 40 %
Canton Lawn Rake....$9, dis 40 %

Razors—J. R. Torrey Razor Co....dis 20 %
Wostenholme and Butcher....$10 to £, dis 10 %

Razor Strops.
Genuine Emerson....dis 60 @ 60&5 %
Imitation Emerson.... ⅌ doz $2.00, dis 20&10&5 %
Torrey's....dis 20 %
Badger's Belt and Combination.... ⅌ doz $2
Lamont Combination.... ⅌ doz $4

Rivets and Burrs.
Copper....dis 60&5 @ 60&10 %
Iron, list October 1, 1886....dis 55 %

Rivet Sets....dis 50&2 @ 50&10 %

Rods.—Stair, Brass....dis 25&2 %
Stair Black Walnut.... ⅌ doz 40¢

Rollers.
Barn Door, Sargent's list....dis 60&10&10 %
Acme (Anti-Friction)....dis 55 %
Union Barn Door Roller....dis 70 %

Rope.—Mnf'rs list, May 28, 1887.
Manila.... ⅝ inch and larger ⅌ ℔ 12½¢
Manila.... ½ inch ⅌ ℔ 13 ¢
Manila.... ⅜ and 5-16 inch ⅌ ℔ 13½¢
Manila Tarred Rope.... ⅌ ℔ 12 ¢
Manila, Hay Rope.... ⅌ ℔ 12½¢
Sisal.... ⅝ inch and larger ⅌ ℔ 12 ¢
Sisal.... ½ inch ⅌ ℔ 12½¢
Sisal.... ⅜ and 5-16 inch ⅌ ℔ 13 ¢
Sisal, Hay Rope.... ⅌ ℔ 12 ¢
Sisal, Tarred Rope.... ⅌ ℔ 11½¢
Sisal, Single Ply Lath Yarn.... ⅌ ℔ 11½¢
Dis 1¢
Cotton Rope.... ⅌ ℔ 15 @ 18¢ net
Jute Rope.... ⅌ ℔ 7¢

Rules.
Boxwood....dis 80&10 @ 80&10&10 %
Ivory....dis 50 @ 55&10 %

Sad Irons.
From 4 to 10, at factory.... ⅌ 100 ℔ $2.50 @ $2.75
Self-Heating.... ⅌ doz. $9.00 net
Self-Heating, Tailors'.... ⅌ doz. $18.00 net
Gleason's Shield and Toilet....dis 25 %
Mrs. Pott's Irons....dis 40 %
Enterprise Star Irons, new list, July 20, 1882....dis 40 %
Combined Fluter and Sad Iron.... ⅌ doz. $15.00, dis 15 %
Fox Reversible, Self-Fluter.... ⅌ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.)....8¼¢, dis 15 %
New England....5¢, dis 15 %

Sand Paper and Emery Paper.
List April 19, 1886....dis 25 @ 20&10 %
Waddell & Co....dis 30 @ 33⅓ %

Sash Cord.
Common.... ⅌ ℔, 10¢ @ 11¢
Patent, good quality.... ⅌ ℔, 13¢ @ 13½¢
White Cotton Braided, fair quality.... ⅌ ℔ 28¢ @ 29¢
Common Russia Sash.... ⅌ ℔ 13½¢
Patent ".... ⅌ ℔ 15¢
Cable Laid Italian ".... ⅌ ℔ 22¢ @ 23¢
India Cable Laid ".... ⅌ ℔ 13¢
Silver Lake, A Quality, White....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab....55¢, dis 10&10&5 %
Silver Lake, B Quality, White....50¢, dis 20&10&5 %
Silver Lake, B Quality Drab....50¢, dis 20&10&5 %
Silver Lake, C Quality White (only)....27¢ @ 29¢
Sylvan Spring, Extra Braided, White....34¢
Sylvan Spring, Extra Braided, Drab....39¢
Semper Idem, Braided, White....30¢
Egyptian, India Hemp, Braided....25¢
Samson, Braided, White Cotton....50¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton....55¢ dis 30 @ 30&5 %
Samson, Braided, Italian Hemp....55¢ dis 30 @ 30&5 %
Samson, Braided, Linen....80¢ dis 30 @ 30&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ⅌ gross....dis 33⅓ %
Ferguson's....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886....dis 50&10 %
Walker's....dis 10 %
Attwell Mfg. Co....dis 25 @ 33⅓ %
Reading....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs....dis 40 %
Common Sense, Japanned, Coppered and Bronzed.... ⅌ gross
Common Sense, Nickel Plated.... ⅌ gross $12.00 net
Universal....dis 30 %
Kempshall's Gravity....dis 60 %
Kempshall's Model....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886....dis 70 %
Payson's Perfect....dis 50&10&5 @ 60 %
Hugunin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887....dis 25&5&2 %
Hugunin's New Sash Locks, list Jan. 5, '87 dis 25&5&2 %
Stoddard "Practical"....dis 10 %
Ives Patent....dis 55 %
Liesche's Nos. 100 & 110, ⅌ gro. $8; 105, $10, dis 20&10 %

Sash Weights.
Solid Eyes.... ⅌ ton, $22.50 @ $25

Sausage Stuffers or Fillers.
Miles' "Challenge".... ⅌ doz. $20, dis 50@50&5 %
Perry.... ⅌ doz. No. 1, $15; No. 0, $21, dis 50@50&5 %
Draw Cut No. 4....each, $80.00, dis 20 %
Enterprise Mfg. Co....dis 20&10 @ 30 %
Silver's....dis 40&10 %

Saws
Disston's Circular, Mill and Cross Cut..dis 45@45&10 %
Disston's Hand, Panel, Rip &c....dis 25 @ 25&10 %
Atkins' Circular....dis 50 %
Atkins' Silver Steel Diamond X Cuts.... ⅌ foot 75 ¢
Atkins' Concave Tooth Dexter X Cuts.... ⅌ foot 55 ¢
Atkins' Special Steel Diamond X Cuts.... ⅌ foot 32 ¢
Atkins' Champion and Electric Tooth X Cuts.... ⅌ foot 30 ¢
Atkins' Hollow Back X Cuts.... ⅌ foot 21 @ 22¢
Atkins' Shingle, Mulay, Drag, &c....dis 45 %
W. M. & C., Hand....dis 30 @ 30&5 %
W. M. & C. Champion X Cuts, Regular.... ⅌ foot 26¢
W. M. & C. X Cuts, Thin Back.... ⅌ foot 29¢
Peace Circular and Mill....dis 45&10 %
Peace Hand Panel and Rip....dis 20&10 @ 20&10&5 %
Peace Cross Cuts, Standard.... ⅌ foot 25¢
Peace Cross Cuts, Thin Back.... ⅌ foot 28¢
Peace Band Saws, all widths....dis 20&10 %
Richardson's Circular and Mill....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢
Boynton's Lightning Panel, Butcher, &c....dis 25&10 %
Boynton's Lightning X Cuts.... ⅌ ft 32¢ @ 33¢
Boynton's Lightning One Man X Cuts.. ⅌ ft 38¢ @ 40¢
Boynton's Lightning Buck Saws.... ⅌ doz $6.00 dis 10 %
Hack Saws—
Griffin's Hack Saws, complete....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only....dis 40&10 @ 50 %
Star Hack Saws and Blades....dis 25 %
Diamond Hack Saws and Blades....dis 25 %

Saw Frames.
White Vermont.... ⅌ gro $9 @ $10
Red, Polished, and Varnished.... ⅌ doz $1.50, dis 25 %

Saw Sets.
Stillman's Genuine.... ⅌ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita.. ⅌ doz $3.25 and $5.25, dis 40&5@40&10 %
Common Lever.... ⅌ doz $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 and 4, $21....dis 40&10 %
Leach's....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate....dis 10 %
Bemis & Call Co.'s Cross Cut....dis 12½ %
Aiken's Genuine....$13.00, dis 50&10 %
Aiken's Imitation....$7.00, dis 50&5 %
Hart's Patent Lever....dis 20 %
Disston's, Star, $9, No. 15, $5.50, dis 20&10@20&10&10 %
Atkins' Adjustable....per doz $6.00
Atkins' Criterion....per doz $7.00
Atkins' Criterion for Hand Saws....per doz $7.50
Croissant Keller), No. 1, $15.00; No. 2, $21.00, dis 33⅓&10 %

Saw Tools.
Atkins' Patent....per doz sets $6.00

Scales.
Hatch, Counter, No. 171, good quality.... ⅌ doz $21
Hatch, Tea, No. 161.... ⅌ doz $6.75 @ $7.00
Union Platform, Plain....$2.30 @ 2.35
Union Platform, Striped....$2.40 @ 2.50
Chatillon's Grocers' Trip Scales....dis 50 %
Chatillon's Eureka....dis 25 %
Chatillon's Favorite....dis 40 %
Family, Turnbull's....dis 30@30&10 %

Scale Beams.
Scale Beams, List of Jan. 12, 1882..dis 60&5 @ 60&10 %
Scale Beams, Custer....dis 30@33⅓ %
Chatillon's No. 1....dis 40 %
Chatillon's No. 2....dis 50

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.)..$6.50, dis 30&10 %
Box, 1 Handle.... ⅌ doz $4.00, dis 10 %
Box, 2 Handle.... ⅌ doz $6.00, dis 10 %
Defiance Box and Ship....dis 20&10 %
Foot....dis 50&10@60 %
Ship, Common.... ⅌ doz $3.50 net
Ship, Providence Tool Co....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame....dis 33⅓&10 %
Screen Corner Irons, Warner's....dis 33⅓ @ 33⅓&10 %

Screw Drivers.
Douglas Mfg Co....dis 20&10@10 %
Disston's....dis 45&10 %
Disston's Patent Excelsior....dis 45&10 %
Buck Bros....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade....dis 70&10 %
Sargent & Co.'s No. 20....dis 66⅔&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel....dis 55&10 %
Sargent & Co.'s No. 60, Round Blade....dis 60&10 %
Knapp & Cowles' No. 1....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra....dis 60 @ 60&10 %
Knapp & Cowles' No. 00 & 4....dis 50&5 @ 50&10 %
Sets interchangeable.... ⅌ doz $18.00, dis 25 %
Champion....dis 25 %
Clark's Patent....dis 33 @ 33⅓ %
Crawford's Adjustable....dis 30 %
Eilrich's Socket and Ratchet....dis 25 @ 25&10 %
Allard's Spiral, new list....dis 25 %
Kolb's Common Sense.... ⅌ doz $6, dis 25&10 %
Syracuse Screw Driver Bits....dis 30 & 30&5 %
Screw Driver Bits.... ⅌ doz. 50¢ @ 75¢
Screw Driver Bits, Parr's.... ⅌ gro. $2.25
Fray's Hol. Hdle. Sets, No. 3, $12....dis. 25 @ 25 & 10 %

Screws
Wood Screws—List, Jan. 27, 1887.
Flat Head Iron....dis 70 %
Round Head Iron....dis 65 %
Flat Head Brass....dis 65 %
Round Head Brass....dis 60 %
Flat Head Bronze....dis 65 %
Round Head Bronze....dis 60 %
{ Extra 10 @ 10 &5 often given by jobbers.
Machine—
Flat Head, Iron....dis 55 ,
Round Head, Iron....dis 50 %
Bench and Hand—
Bench, Iron....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.... ⅌ doz $2.25
Bench, Wood, Hickory....dis 20&10 %
Hand, Wood....dis 25&10 @ 25&10&5 %
Lag, Blunt Point....dis 70 %
Coach and Lag, Gimlet Point....dis 66⅔@66⅔&5 %
Bed....dis 25&5 %
Hand Rail, Sargent's....dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s..dis 70&10@75 %
Hand Rail, Am. Screw Co....dis 75 %
Jack Screws, Millers Falls list....dis 50 @ 50&5 %
Jack Screws, P. S. & W....dis 35 %
Jack Screws, Sargent....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns'....dis 40 %

Scroll Saws.
Lester, complete, $10.00....dis 25 %
Rogers, complete, $4.00....dis 25 %

Scythes.
Grain Scythes—
Clipper, Full Polished, Boxed & Sharp..$6.50@6.75
German, Cast or Silver Steel, either Half Set or Waldron, in Straw....6.00@6.25
Grass Scythes—
Silver Clipper, Boxed and Sharp....5.50@5.75
German Steel, Half Set Waldron....4.75@5.00
Bush, Bramble and Weed....5.00@5.25
Clover....5.50@5.75
Imperfect Grass and Bush....4.00@4.25
Imperfect Grain....4.50@4.75

Scythe Snaths....dis 50 @ 50&10 %

Shears.
American (Cast) Iron....dis 75&10 @ 75&10&5 %
Pruning....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.... ⅌ doz $3.75
Tinners'....dis 20&2 %
Seymour's, List, Dec., 1881....dis 60&10&5 %
Heinsch's, List, Dec., 1881....dis 60&10 %
Heinsch's Tailor's Shears....dis 33⅓ %
First quality C. S. Trimmers....dis 80 %
Second quality C. S. Trimmers.dis 80&10 @ 80&10&5 %
Acme Cast Shears....dis 10&10 %
Diamond Cast Shears....dis 10 %
Clipper....dis 10&10 %
Victor Cast Shears....dis 75&10 %
Howe Bros. & Hulbert, Solid Forged Steel....dis 40 %
Cleveland Machine Co., Solid Steel Forged....dis 70 %

Sheaves.
Sliding Door—
M. W. & Co., list Jan. 1, 1887....dis 50&10&2 %
R. & E., list Dec. 18, 1885....dis 55&2 %
Corbin's list....dis 60&10&2 %
Patent Roller....dis 60&10&2 %
Patent Roller, Hatfield's....dis 70 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2 %
Moore's Anti-Friction....dis 60 %
Sliding Shutter—
R. & E. list Dec. 18, 1885....dis 60&10&2 %
Sargent's list....dis 60&10 %
Reading list....dis 60&10&10 %

Ship Tools.
L. & I. J. White....dis 20&5 %
Albertson Mfg. Co....dis 25 %

Shoes, Horse, Mule, &c.
Horse—
Burden's, Perkins', Phoenix, at factory....$4.00
Mule—Add $1 ⅌ keg to above prices.
Ox, Wrought—
Ton lots.... ⅌ ℔ 9¢
1000 ℔ lots.... ⅌ ℔ 9½¢
500 ℔ lots.... ⅌ ℔ 10¢

Shot.—(*Eastern prices.*)
Drop, ⅌ bag, 25 ℔ (2¢ off for cash in 5 days....$1.40
Drop, ⅌ bag, 5 ℔....30¢
Buck and Chilled, ⅌ 25-℔ bag....$1.75
Buck and Chilled, ⅌ 5-℔ bag....40¢

Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885....dis 20 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron....dis 50&10 %
Griffith's C. S....dis 50&10@50&5 %
Griffith's Solid Cast Steel R. R. Goods....dis 20 %
Old Colony....dis 15 @ 15&10 %
St. Louis Shovel Co....dis 15 @ 15&7½ %
Hussey, Binns & Co....dis 15 @ 25 %
Hubbard & Co....dis 20@20&7½ %
Lehigh Mfg. Co....dis 50&10 %
Payne Pettebone & Son, list January, 1886....dis 30 %
Remington's (Lowman's Patent)....dis 30&10 @ 40 %
Rowland's, Black Iron....dis 50&10 %
Rowland's Steel....dis 60 @ 60&5 %

Shovels and Tongs.
Iron Head....dis 60&10@60&10&5 %
Brass Head....dis 60&10&10 %

Skeins, Thimble.
Western list....dis 70&10@75 %
Columbus Wrt. Steel....dis 33⅓&5 %

Sieves.
Buffalo Metallic, S. S. & Co., new list....dis 50&25 %
Barler Flour Sifters.... ⅌ doz $2.00

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested, ⅌ doz.	70¢	90¢
Mesh 20, Nested, ⅌ doz.	85¢	$1.00
Mesh 24, Nested, ⅌ doz.	$1.00	1.10

Slates.—School, by case....dis 50 @ 50&5 %

Snaps, Harness, &c.
Anchor (T. & S. Mfg Co.)....dis 65 %
Fitch's (Bristol)....dis 50&10 %
Hotchkiss....dis 10 %
Andrews....dis 50 %
Sargent's Patent Guarded....dis 70&10&10 %

German, new list....dis 10&10 %
Covert....dis 50&2 %
Covert, New Patent....dis 50&5&2 %
Covert New R. E....dis 50&2 %
Covered Spring....dis 66⅔&10 %

Soldering Irons.
Covert's Adjustable list Jan. 1, 1886....dis 35&2 %

Spoke Shaves—Iron....dis 45 %
Wood....dis 30 %
Bailey's (Stanley R. & L. Co.)....dis 40&10 %
Stearns'....dis 30&10 %

Spoke Trimmers.
Bonney's.... ⅌ doz $10.00, dis 50 %
Stearns'....dis 20&10 %
Ives'....No. 1, $15.00; No. 2, $12.00 ⅌ doz, dis 55&10 %
Douglass'.... ⅌ doz $9.00, dis 20 %

Spoons and Forks.
Tinned Iron—
Basting, Central Stamping Co.'s list....dis 25&2½—%
Solid Table and Tea, Central Stamping Company's list....dis 25&2½ %
Buffalo, S. S. & Co....dis 33⅓&2 %
Silver-Plated—
Meriden Brit. Co., Rogers....dis 50&5 %
C. Rogers & Bros....50&5 %
Rogers & Bro....50&5 %
Reed & Barton....dis 50&5 @ 50&10&5 %
Wm. Rogers Mfg. Co....dis 50&10 @ 60 %
Simpson, Hall, Miller & Co....dis 50&10&5 @ 60 %
Holmes, Booth & Haydens....dis 50&10&5 @ 60 %
Holmes & Edwards Silver Co....dis 60&5 %, cash
H. & E. Silver Co. Mexican Silver..dis 50&10&5 %, cash
German Silver....dis 50 @ 50&5 %
German Silver, Hall & Elton....dis 40&5 %
Nickel Silver....dis 50&5@50&10&5 %, cash
Britannia....dis 60&10 @ 60&10&10 %

Springs.
Elliptic, Concord, Platform and Half Scroll....dis 60&10 @ 60&10&10 %
Cild's Bolster Springs....dis 25 %

Squares
Steel and Iron.... }
Nickel-Plated.... } dis 75 @ 75&10 %
Try Square and T Bevels....dis 60&10 @ 60&10&10 %
Disston's Try Square and T Bevels....dis 45&10 %
Winterbottom's Try and Miter....dis 30&10 %

Staples.
Fence Staples, Galvanized.... ⅌ ℔, 4¼ @ 4½¢
Fence Staples, Plain.... ⅌ ℔, 3¼ @ 3½¢

Steelyards....dis 40&10@50&5 %

Stocks and Dies
Blacksmith's, Waterford Goods....dis 40 @ 40&5 %
Blacksmith's, Butterfield's....dis 45 %
Lightning Screw Plate....dis 25 @ 30 %
Reece's New Screw Plates....dis 33⅓ @ 33⅓&5

Stone.
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 5¢..
Sand Stone.... ⅌ ℔, 2¢
Washita Stone, Extra.... ⅌ ℔, 20 @ 21¢
Washita Stone, No. 1.... ⅌ ℔, 16 @ 17¢
Washita Stone, No. 2.... ⅌ ℔, 13¢
Washita Slips, No. 1, Extra.... ⅌ ℔, 47 @ 48¢
Washita Slips, No. 1.... ⅌ ℔, 37 @ 38¢
Arkansas Stone, No. 1, 4 to 6 in.... ⅌ ℔, $1.35
Arkansas Stone, No. 1, 6 to 9 in.... ⅌ ℔, $1.75
Turkey Oil Stone....4 to 8 in.. ⅌ ℔, 40¢
Turkey Slips.... ⅌ ℔, $1.00 @ $1.50
Lake Superior, Chase.... ⅌ ℔, 16¢
Lake Superior Slips, Chase.... ⅌ ℔, 31@32¢
Seneca Stone, Red Paper Brand, ⅌ ℔....18 @ 20¢
Seneca Stone, High Rounds, ⅌ ℔....20 @ 25¢
Seneca Stone, Small Whets, ⅌ gro....$24.00

Stove Polish.
Joseph Dixon's.... ⅌ gro $6.00, dis 10 %
Gem.... ⅌ gro $4.50, dis 10 %
Gold Medal.... ⅌ gro $6.00, dis 25 %
"Mirror".... ⅌ gro $6.00, dis — %
Lustro.... ⅌ gro $4.75 net
Ruby.... ⅌ gro $3.75 net
Rising Sun, 5 gro. lots.... ⅌ gro $5.50
Dixon's Plumbago.... ⅌ ℔ 8¢ net
Boynton's Noon Day ⅌ gro....$5.00
Parlor Pride Stove Enamel.... ⅌ gross, $13
Yates' Liquid, 2 3 5 10 gal. cans
⅌ gal $0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, per ℔., 15¢
Jet Black.... ⅌ gro $3.50
Japanese.... ⅌ gro $3.50
Fireside.... ⅌ gro $2.50

Tacks, Brads, &c.
List, Sept. 1, 1882, and supplement, Jan. 1, 1886.
American Iron Tacks, Carpet....dis 75 %
Steel Carpet Tacks....dis 75 %
Swedes Iron Carpet Tacks....dis 75 %
Swedes Iron Wire Carpet Tacks....dis 70&10 %
Swedes Iron Tacks....dis 70&5 @ 70&10 %
Swedes Iron Upholsterers' Tacks....dis 70 %
Tinned Swedes Iron Tacks....dis 70 %
Tinned Swedes Iron Upholsterers' Tacks....dis 70 %
Gimp and Lace Tacks....dis 70 %
Tinned Gimp and Lace Tacks....dis 60&10&10 @ 70 %
American Iron Cut Tacks....dis 70&5 @ 70&10 %
Copper Tacks....dis 60 @ 60&5 %
Copper Finishing and Trunk Nails....dis 60 @ 60&5 %
Cigar Box Nails....dis 55 %
Finishing Nails....dis 60 @ 60&10 %
Hungarian Nails and Miners' Tacks....dis 60&10 %
Trunk and Clout Nails....dis 60&10 %
Tinned Trunk and Clout Nails....dis 60&10 %
Basket Nails....dis 60&10 %
Chair Nails....dis 60&10 %
Common and Patent Brads....dis 60&10 %
Tinned Capped Trunk Nails....dis 50 %
Looking Glass Tacks....dis 50 %
Picture-Frame Points....dis 50 %
Leathered Carpet Tacks....dis 50 %
Brush Tacks....dis 50 %
Shoe Finders'....List Feb. 1, 1886, dis 10 %
Lining and Saddle Nails, List Jan. 1, 1880;
Silvered....dis 30&10&10 %
Japanned....dis 20&10&10 %
Walkley Hardware Co.'s Steel Carpet Tacks:
Diamond Brand.... ⅌ doz 12¢; tinned, 16¢
Circle Brand.... ⅌ doz 24¢; tinned, 32¢
Horse Shoe Brand....uniform wts., 12¢; tinned, 16¢
Horse Shoe Brand, double unif'm wts., 22¢; tin'd, 30¢
In case lots....dis 10 %
Double-pointed Tacks....dis 80&10 @ 80&10&10 %
Wire Carpet Nails....dis 50 @ 50&10 %
Steel Wire Brads, R. & E. Mfg. Co....dis 50 @ 50&10 %

Tap Borers.
Common and Ring....dis 20&10 %
Ives' Tap Borers....dis 33⅓&5 %
Enterprise Mfg. Co....dis 20&10 @ 30 %
Clark's....dis 33⅓ @ 35 %

Tapes, Measuring.—American....dis 25&10 %
Spring....dis 40 %
Chesterman's....Regular list dis 25 @ 30 %

Thermometers—Tin Case....dis 80 @ 80&10 %

Thimble Skeins.—See Skeins.

Ties, Bale.
Steel Wire, Standard list....dis 50&10 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.)....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co....dis 33⅓ %

Tinware.
Stamped, Japanned & Pieced, list Jan. 20, 1887....dis 75 @ 75&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion)....dis 20&10 @ 30 %
Wood Bottom.... ⅌ doz $5.00 @ $5.25
All Iron.... ⅌ doz $4.25
Nashua Lock Co.'s.... ⅌ doz $18.00, dis 50 @ 55 %
Wilson's....dis 55 %
Clipper (Sargent & Co.).... ⅌ doz $24, dis 50&10&10 %
Acme.... ⅌ doz $20.00, dis 40 %

Transom Lifters.
Wollensak's Patent Iron Bronzed....dis 50 %
Reiher's Bronzed Iron Rods list Jan. 1, 1887 dis 50&2 %
Reiher's Real Bronze or Nickel Plate, list Jan. 1, 1887....dis 10&2 %
Excelsior....dis 50&10&2 %
Shaw's....dis 45&10 %
Payson's Universal....dis 40 %
Crown and Star....dis 50

Traps.
Game—
Newhouse....dis 35 @ 40 %
Oneida Pattern....dis 60&10&10 @ 70 %
Game, Blake's Patent....dis 40&10&5 %
Mouse and Rat—
Mouse, Wood, Choker.... ⅌ doz holes, 15¢
Mouse, Round Wire.... ⅌ doz $1.50, dis 10 %
Mouse, Cage, Wire.... ⅌ doz $2.50, dis 10 %
Mouse, Catch 'em alive.... ⅌ doz $2.50, dis 15 %
Mouse, "Bonanza".... ⅌ gross $10 net
Mouse, Delusion.... ⅌ gross $18.00 dis 15 %
Rat, "Decoy".... ⅌ gross $10.00 dis 30 %
Ideal.... ⅌ gross $10
Cyclone.... ⅌ gross [illegible]

Trowels
Lothrop's Brick and Plastering....dis 25 %
Reed's Brick and Plastering....dis 15 %
Disston's Brick and Plastering....dis 25 @ 25&10 %
Peace's Plastering....dis 25 %
Clement & Maynard's....dis 20 %
Rose's Brick....dis 15 @ 20 %
Brade's Brick....dis 25 %
Worrall's Brick and Plastering....dis 20 %
Garden....dis 50 %

Triers.—Butter and Cheese....dis 25 %

Trucks, Warehouse, &c.
Penfield Block Co.'s list, 1882....dis 40 %

Tubes, Boiler.—See Pipe

Twine.

	BC.	b.
No. 9, Flax Twine, ¼ and ½ ℔ Balls	22¢	30¢
No. 12, " " ¼ and ½ "	20½¢	28¢
No. 18, " " ¼ and ½ "	18½¢	28¢
No. 24, " " ¼ and ½ "	18½¢	27¢
No. 36, " " ¼ and ½ "	17¢	26¢

No. 204, Mattrass, ¼ and ½ "....15¢
Chalk Line, Cotton, ½ ℔ Balls....25¢
Mason Line, Linen, ½ "....55¢
2 Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)....12¢
3 Ply Hemp, 1 ℔ Balls....12¼¢
3 Ply Hemp, 1½ ℔ Balls....11½¢
Cotton Wrapping, 5 Balls to ℔....14¢ @ 15¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls....9½¢
Wool....5½¢ @ 6¢
Paper....13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz....17¢

Vises.
Solid Box....dis 50&10&5 @ 60 %
Parallel—
Fisher & Norris Double Screw....dis 15&10 %
Stephens'....dis 25 %
Parker's....dis 20 @ 25 %
Wilson's....dis 55 %
Howard's....dis 40 %
Bonney's....dis 40 %
Millers Falls....dis 40 @ 40&10 %
Trenton....dis 40&5 @ 40&10 %
Merrill's....dis 15@20 %
Sargent's....dis 60&10&10 %
Backus and Union....dis 40
Double Screw Leg....dis 15&10 %
Prentiss....dis 20&5 @ 25 %
Simpson's Adjustable....dis 40 %
Saw Filers—
Bonney's, Nos. 2 & 3.... ⅌ doz $15.00, dis 40 %
Stearn's....dis 33⅓&10 %
Stearn's Silent Saw Vises....dis 35 %
Sargent's....dis 60&10&10 %
Hopkins'.... ⅌ doz $17.50, dis 10 %
Reading....dis 37½ %
Wentworth....dis 20&10 %
Combination Hand Vise.... ⅌ gro, $12.00
Cowell Hand Vises....dis 20 %
Bauer's Pipe Vises....dis 10 %
Amateur Vises.... ⅌ gro, $18.00

Wagon Boxes
Per lb....2½¢

Washer Cutters.
Smith's Patent.... ⅌ doz $12.00, dis 20&10&10 %
Johnson's.... ⅌ doz $11.00, dis 33⅓ %
Penny's.... ⅌ doz Pol. $14; Jap'd, $10, dis 25 %
Appleton's.... ⅌ doz $16.00, dis 60&10 %
Bonney's....dis 30&10 %

Washers.—See Nuts and Washers.

Wedges.—Iron.... ⅌ ℔ 3½¢
Steel.... ⅌ ℔ 4 ¢

Well Buckets, Galvanized
Hill's.... ⅌ doz., 12 qt., $3.50; 14 qt., $4.50
Iron Clad.... ⅌ doz., 14 qt., $8, dis 40 @ 40&5 %
Whiting's Flat Iron Band.... ⅌ doz $4.25
Whiting's Wired Top.... ⅌ doz $4.00

Well Wheels—8 in., $2; 10 in., $2.50; 12 in., $3.25

Wire.
Iron—
Market, Br't & Ann'ld, Nos. 0 to 18....dis 70&5@72½ %
Market, Coppered, Nos. 0 to 18....dis 65&10@70 %
Market, Galvanized, Nos. 0 to 18....dis 60&7½@65 %
Market, Tinned, Tinned list Nos. 0 to 18....dis 60 %
Stone, Bright and Ann'd, Nos. 16 to 18....dis 70@72½ %
Stone, Bright and Ann'd, Nos. 19 to 26....dis 72½@75 %
Stone, Bright & Ann'd, Nos. 27 to 36....dis 75@75&10 %
Stone, Tinned, Tin'd list, Nos. 18 to 36....dis 75@75&10 %
Tinned Broom Wire, Nos. 18 to 24....dis 70@72½ %
Galvanized Fence....dis 60&7½@65 %
Annealed Fence, Nos. 8 & 9....dis 70 %
Annealed Grape, Nos. 19 to 14....dis 70 %
Brass and Copper, list, Jan. 18, '84....dis 25@25&5 %
Barb Fence....See Trade Report
Wire on Spools....dis 65 %
Malin's Spld. Wire, 1 ℔, ½ ℔ & ¼ ℔ sp'ls....40&10&5 %
Cast Steel Wire....[illegible]
Stubs' Steel Wire....$6.00 to £, dis 30 %
Steel Music Wire, Nos. 12 to 30....55¢ ⅌ ℔
Picture Wire....dis 60&[illegible]
Barb Wire Safety Guards.... ⅌ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines

Wire Cloth, green, drab and black, ⅌ 100 sq. ft. No. 34 Wire $1.90; No. 33 Wire, $2.10

Wire Goods.—See Bright Wire Goods.

Wire Rope—List May 1, 1886....dis 33⅓

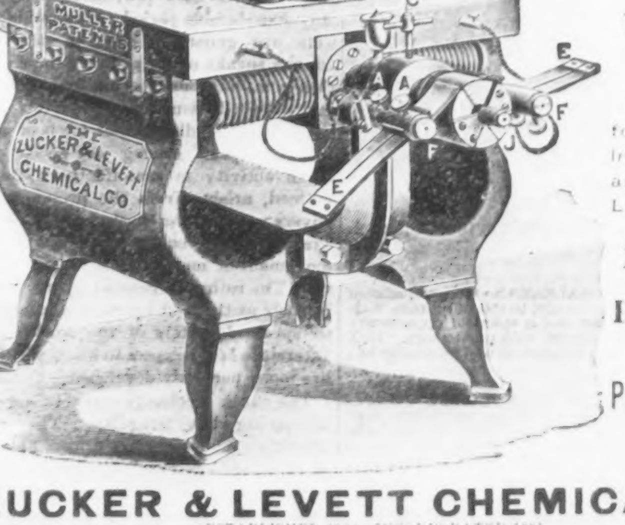
Wrenches—American Adjustable....dis 40 %
Baxter's Adjustable "S"....dis 35&10 %
Baxter's Diagonal....dis 40 @ 40&10 %
Coes' Genuine....dis 55&2 %
Coes' "Mechanics'"....dis 55&10 %
Coes' Pattern, Malleable....dis 80&10 @ 80&10&5 %
Coes' Pattern, Wrought....dis 80&10@80&10&5 %
Girard Standard....dis 70&10 %
Girard Agricultural....dis 80&10 @ 80&10&5 %
Lamson & Sessions' Engineers'....dis 60&10 %
Lamson & Sessions' Standard....dis 70&10 %
Lamson & Sessions' Agricultural dis 80&10@80&10&5 %
Sterling Wrench, Wrought....dis 80&10@80&10&5 %
Bemis & Call's Patent Combination....dis 35 %
Bemis & Call's Merrick's Pattern....dis 35 %
Bemis & Call's Brigg's Pattern....dis 35 %
Bemis & Call's Cylinder or Gas Pipe....dis 40&5 %
Bemis & Call's No. 3 Pipe....dis 35&5 %
Aiken's Pocket (Bright)....$6.00, dis 20&10 %
The Favorite Pocket (Bright).... ⅌ doz $4.00, dis 10 %
Webster's Patent Combination....dis 25 %
Boardman's....dis 25@25&10 %
Always Ready....dis 25&5
Alligator....dis 50 %
Donohoe's Engineer....dis 25 %
Acme, Bright....dis 60&5 @ 60&10 %
Acme, Nickeled....dis 45 %
Acme, Bicycle, 4½ in....dis 45 %
Walker's....dis 55&5 %
Diamond....dis 40 %
Diamond Patent Steel....dis 40 %

Wrought Goods.
Staples Hooks, &c., list Jan. 12,'87....dis 80&10@80&15 %

$100 | AMERICAN GIANT DYNAMO | $100

Electro-Plating and Electrotyping Machines

IN ALL SIZES, FROM $100 UPWARDS.



CHEAPEST AND BEST IN THE MARKET.

Headquarters for everything in the Plating and Polishing Line.

NICKEL PLATING AND POLISHING MATERIALS.

ZUCKER & LEVETT CHEMICAL CO.,

ESTABLISHED 1863, INCORPORATED 1881,

SOLE MANUFACTURERS AND PATENTEES,

WORKS: 538 to 564 W. Sixteenth St, OFFICE: 36 to 40 Eleventh Ave., New York, U. S. A.

Special Notices.

SITUATIONS WANTED.

BY A YOUNG UNMARRIED MAN, 22 years of age, a position in a live wholesale or retail Hardware House, five years' experience in the retail trade. Best of reference. Address "S. TAYLOR," Crown Point, N. Y.

MECHANICAL ENGINEER, having for the past three years entire practical management of Bessemer Steel Works in England, desires employment where general engineering intelligence and trustworthy services are required; practical knowledge of wire rod mills, &c.; total abstainer; highest references. Address "DRAWERS," Uxbridge, Ontario, Canada.

A PRACTICAL AND ENERGETIC MAN wishes an engagement as MILL MANAGER or Assistant Superintendent. Has had above 20 years' experience in the manufacture of all classes of Merchant Iron and Steel Sheets, Plates, Nails, Rod and Hoop, &c. Good recommendations from all former employers. HENRY McRAE, Homestead, Allegheny Co., Pa.

MECHANICAL ENGINEER of 20 years' experience in designing, constructing and superintending building of engines and machinery in general, wishes to find suitable employment; would prefer a situation as superintendent or as draughtsman in a place where could be alone. Address "MECHANICAL ENGINEER," Office of *The Iron Age*, 66 and 68 Duane St., New York.

A GENTLEMAN OF THOROUGH EXPERIENCE in the HARDWARE BUSINESS in all its details will be open to an engagement July 1. Address "VIATOR," Office of *The Iron Age*, 66 and 68 Duane Street, New York.

MILL MANAGER.—Wanted a position as Mill Manager; 20 years' experience in fine sheet-plate Iron and Steel; thorough knowledge of the business; experience with both gas and coal, loose or light iron; salary an object. Address "ECONOMY," Office of *The Iron Age*, 77 4th Ave., Pittsburgh, Pa.

A MIDDLE-AGED ACTIVE MAN, many years of experience in the general conduct of Coke and Anthracite Blast Furnaces, desires position to take charge of Furnace Plant. Satisfactory references. Will go South. Fully competent to blow and construct furnaces, locate and equip Mining Operations and conduct the general business in all its branches, including the placing of Iron, &c. Address "MANAGER," care of Mr. John M. Hartman, Furnace Engineer, 1235 North Front Street, Philadelphia.

MANAGER OF WIRE NAIL WORKS. Open for an engagement. Draughtsman and Machinist who has had twenty years experience in building and operating WIRE NAIL MACHINES. Address "THORN," P. O. Box 787 Pittsburgh, Pa.

MECHANICAL ENGINEER and DRAUGHTSMAN, thoroughly competent, with a wide experience in draughting, estimating and constructing engine and boiler work, millwork and machinery, structural work, &c., and also in planning and building new plants, &c., desires an engagement. Address "M. E. A. D.," Office of *The Iron Age*, 66 and 68 Duane St., New York.

A GENTLEMAN who has had an extensive business experience and who possesses business abilities of a high order, would like to make an arrangement to take charge of a Chicago Agency for some first-class Eastern manufacturing firm. Best of references, both East and West. Address "H.," Office of *The Iron Age*, 66 and 68 Duane Street, New York.

NAIL PLATE ROLLER AND HEATER.—Situation wanted by a competent man of 20 yrs. experience as roller in some of the best mills in the country. Is sober, steady and reliable. Recommendations first class. Address "ROLLER," Care of Office of *The Iron Age*, 66 and 68 Duane Street, N. Y.

HELP WANTED.

Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.

SALESMEN WHO SEE THE HARDWARE TRADE to sell a SPECIALTY of merit on commission. MOORE & BARNES MFG. CO., 103 Chambers St., New York.

WANTED—A thoroughly competent FOUNDRY FOREMAN for general and special work; must understand his business and show evidence of his capacity and good habits; will pay good salary to right man; no man who cannot show that he is thoroughly capable need apply. Address, by letter, M. ADDY & CO., St. Louis, Mo.

FOUNDRY FOREMAN, who can invest about $2500 to take charge of a new plant in St. Paul, Minnesota. A splendid opening to the right party and an opportunity seldom offered. Address "IRON," 42 East 8th St., Cincinnati, Ohio.

WANTED

BY A

PHILADELPHIA HOUSE,

A MAN OF

FIRST-CLASS ABILITY

TO TRAVEL,

VISITING THE

HARDWARE AND KINDRED TRADES

ADDRESS

"LYOR,"

Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

A FIRST CLASS SALESMAN—One acquainted with the paper trade, to sell our Brass Wire Cloth; a new house and a splendid opportunity for a good man. Address, with particulars, "BOX [illegible]," Office of *The Iron Age*, 66 and 68 Duane St., New York.

AS MANAGER—A THOROUGHLY COMPETENT MAN for a puddling and rolling mill. Apply by letter to "J. S.," Office of *The Iron Age*, 66 and 68 Duane Street, New York.

R[illegible] must be a first class workman and well recommended. Address "H. M.," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

CHEMIST familiar with Blast Furnace Work; [illegible] competent and experienced. Address "F. E.," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, June 1, 1887.

Scotch Pig.—The market is irregular. Warrants close at 41/6, against 41/7 last week. Makers' brands are quoted as under:

Coltness, alongside, Glasgow		58/6
Langloan, "	"	50/
Glengarnock, "	Ardrossan	47/
Gartsherrie, "	Glasgow	48/
Shotts, "	at Leith	48/6
Dalmellington, "	Ardrossan	43/6
Carnbroe, "	"	43/6
Eglinton "	"	42/6
Summerlee		52/6

Carriage from Ardrossan to Glasgow is 1/ ⅌ ton.

Bessemer Pig.—The market is a little steadier. We quote W. C. Hematites, Nos. 1, 2 and 3, 44/ @ 45/6.

Cleveland Pig.—The market is a little steadier at unchanged prices, viz.: 37/ for No. 1 Foundry; 36/ for No. 2; 34/ @ 35/ for No. 3, and 33/6 for No. 4 Forge.

Bessemer Billets.—Bessemer Billets, 2½ x 2½ inches, are 72/6 @ 75/

Bessemer Blooms—The market is unchanged. We quote Blooms, 7 x 7 inches, 72/6 @ 75/.

Bessemer Crop Ends.—We quote run of mill 53/ @ 55/.

Manufactured Iron.—The market is irregular. We quote:

	£	s.	d.		£	s.	d.
Staff. Ord. Marked Bars	6	0	0	@	6	10	
" Medium "	5	0	0	@	5	10	0
" Common "	4	15	0	@	5	0	0
Hoops, 20 W. G. and over.							
" Common Best	5	0	0	@	6	0	0
" Medium	5	10	0	@	5	10	0
" Common	5	0	0	@	...		
Sheets, 20 W. G. and under.							
" Ordinary Best	6	5	0	@	6	15	0
" Common	5	10	0	@	6	0	0

Welsh Bars are quoted £4. 2/6 @ £4. 5/.

Steel Rails.—The market is unchanged, with prices at £4 @ £4. 2/6.

Old Rails.—The market is quiet, with moderate offerings and small sales. Prices are nominally 60/ @ 62/6 for Tees c.i.f. New York, and 60/ @ 65/ for Double Heads.

Scrap.—The market is irregular, with Heavy Wrought at 52/6 @ 55/, c.i.f. New York.

Copper.—The market is unchanged. Chili Bars closing £39. 5/ @ £39. 10/, and Best Selected, £44 @ £44. 10/.

Tin.—The market is unchanged, spot closing £103. 15/ @ £104. 5/, and futures £104. 5/ @ £104. 15/.

Tin Plates.—The market is a little steadier. We quote:

Tin Plates, 10x14, 1st qual.	Charcoal	16/6	@	17/6
" " 2d	"	14/6	@	16/
" " 1st	Coke	13/6	@	14/
" " 2d	"	12/9	@	13/3

Spelter.—The Market is firmer. We quote £14. 5/ @ £14. 7/6.

Lead.—We quote £12. 7/6 @ £12. 10/. Common English Pig.

Freights.—Steam freights from Glasgow to New York are 7/6, and Liverpool to New York 8/ @ 9/.

Financial.

Office of *The Iron Age*,
WEDNESDAY EVENING, June 1, 1887.

There are no notable changes in the outlook for trade and finance. The most cheering feature perhaps is the decided improvement in the crop prospects in the Northwest, the drought which prevailed in large sections of the grain belt having been relieved by refreshing rains, but observers in the arena of trade deprecate the fact that the markets for grain and produce generally are to such an extent controlled by speculative influences, so that prices depend rather on manipulation than the productiveness of the harvest. The wheat market, while irregular, is generally strong under a good export demand. Cotton has continued active and higher. In the wholesale grocery trade a favorable feature is the steadiness of values, nearly all the leading staples being quoted firm, with a tendency in some instances to a higher basis. The coffee speculation is unabated, with prices higher than previously recorded for any considerable period. The produce markets are generally dull. A letter from Omaha speaks of the growing importance of that point as a market for hogs and cattle, and the prediction is made that it is destined to become a leading center for beef packing in the West. Among dry-goods jobbers more activity in manufactured cottons is noticed, arising from the presence of new buyers; otherwise business is restricted. Transportation companies speak of a free movement of merchandise coastwise and by rail. The railroad agencies report no changes in their methods of business, and are unable to speak definitely of the working of the Interstate law—expect to know when results are more perfectly developed.

The Stock Exchange markets were generally strong but irregular. The news on Thursday favored higher prices, Foreign exchange was reduced, crop reports were good, and railroad earnings for the third week in May were all larger. Reading was the feature of the day, on rumors of large earnings and transactions were heavy. On Friday prices had a downward tendency all round, with Reading firm and Jersey Central higher. On Saturday the market was dull. On Tuesday Reading furnished one-third of the day's business, and the treasurer's exhibit showing the surprising gain of $948,817 net earnings for the month gave buoyancy to the whole market. The coal shares, too, formed a leading feature and advanced 1 to 1¾ per cent. London bought Reading largely. To day at the opening prices were again higher. Reading, St. Paul and Wheeling and Lake Erie, together with Northwestern were all active, partly due to trading on the new Chicago Stock Exchange, just opened.

United States bonds closed as follows:

U. S. 3s	.....	@	.....
U. S. 4½s, 1891, coupon	109⅝	@	109⅞
U. S. 4s, 1907, coupon	129½	@	129¾
U. S. Currency 6s, 1895	123½	@	.....
U. S. Currency 6s, 1896	126½	@	.....
U. S. Currency 6s, 1897	129	@	.....
U. S. Currency 6s, 1898	132	@	.....
U. S. Currency 6s, 1899	134	@	.....

The bank statement was again favorable, showing an increase of $1,122,400 in surplus reserve, which now stands at $5,779,600. In loans there was a contraction of $1,380,000. The banks gained by the interior currency movement, which was largely in favor of this point; but the Treasury receipts continue much heavier than disbursements. The deposits other than United States are down to $3,195,200. The total bank clearings in 36 cities last week show an increase of 9.5 % compared with 1886; outside of New York the increase is 26.15 %. This exhibit is unfavorable compared with that of the previous week, but favorable when compared with the corresponding week of last year, nearly every important reporting point showing a percentage of gain. The posted rates for bankers' sterling are $4.86½ @ $4.87 for 60-day, and $4.88 @ $4.8½ for sight. The market is weak.

Another element of disturbance in monetary affairs is the enormous and growing Treasury surplus. A writer at Washington, who is evidently familiar with the subject, remarks that on June 30, the end of the fiscal year, the reports of the Treasury will show that the country has been called upon to contribute, during 12 months, more than $100,000,000 in excess of the needs of the Government. This is in excess of the surplus revenue in 1886, and will be about as large a surplus as that in 1884, and greater by many millions than the excess of revenue in any one year from 1871 to 1881. It will be much greater than was expected a year ago, when the Treasury Department estimate of receipts was $356,000,000 and its estimate of expenditures $314,000,000. The expenditures will be but about $266,000,000, while the receipts will not be far short of $370,000,000, leaving an excess of $104,000,000. This continued absorption by the Treasury will be more noticeable after the last call for 3 per cents matures July 1, but Mr. Manning's successor is not apprehensive of any consequences that may not be averted by judicious management, and our leading bankers are not disturbed by the clamor of those who predict tight money the coming summer. Despite these assurances money lenders manifest a preference for 60 to 90 days' paper, except on the best collateral. The banks of England, France and Germany report gains in gold, the ministerial crisis in France being viewed with apparent unconcern. The Bank of England rate remains 2 %, favorably influencing the market here. Commercial paper is in good demand by several institutions at short dates. We quote 60 to 90 days' 4¾ @ 5¼ %; longer dates, 5½ @ 6½ %. The exports of specie for the week amounted to $237,000, making a total of $8,661,000 since January 1, against $32,183,000 for the same time last year, and the imports were $287,000, making a total since January 1 of $5,646,000, as compared with $5,646,000 for the same time in 1886.

The imports of merchandise at this port during the week were $4,373,000 below those of the previous week, the total valuation being $7,050,000. The total since January 1, is $191,782, against $179,000,000 for the same time last year, and $160,434,000 in 1885. The exports are $847,000 below those of the previous week, the total valuation being $4,896,092, making $121,522,472 since January 1, compared with $126,000,000 for the same time last year, and $140,800,000 in 1885. Included are 1,103,665 bushels of wheat, 277,897 bushels of corn, 4438 bales of cotton and 2,783,700 gallons of petroleum.

Our foreign trade continues unsatisfactory, apprehensions on this point being verified by the official returns for April showing that the imports into the United States for the month exceed the total exports by more than $13,500,000. These items compare for two years as follows:

	1886.	1887.
Total imports in April	$58,844,708	$65,283,450
Total exports in April	60,653,501	51,703,872
Balance of trade	1,808,793	13,579,578

As this showing is the most unfavorable one for many months, and as the trade for May will not show any material improvement, the inference is warranted that our exchange market has been largely influenced by American securities sold or temporary loans effected in London, probably to an extent much beyond the amount generally credited. As an indication the fact is noted that, as shown by the report of the Union Pacific Railroad just issued, the holdings of that single stock in Europe have increased 65,000 shares, or, say, $4,000,000, compared with one year ago.

General Hardware.

During the past week trade has continued without much variation in volume, and without any material change in prices. Most of the orders are for small quantities to meet present requirements, the large trade not showing any disposition to anticipate their wants. The general tone of the market is steady, with perhaps a slight tendency toward less firm prices in certain lines. Manufacturers in most cases are well supplied with orders, and the aggregate of the business of the past month, as for the year thus far, is generally referred to as in excess of last year's.

NAILS.

Nails in New York continue in an unsatisfactory condition, there being sharp rivalry between a few sellers, to which must be added the fact that a small concern is still working up its stock of raw materials, which will probably keep it running during the greater part of this month. The only hope for an improvement lies in the slow cure of a restricted supply, which is now beginning to be applied. Quite a number of mills have closed down, and others are running slowly, while the strongest in the trade are not endeavoring to meet the low quotations which continue to be made. We quote $2.15 @ $2.20 from store for small lots, with a varying abatement for carload lots.

BARB WIRE.

The market in New York and in the territory tributary to it is in a better condition than that of other sections, notably the West. We quote carload lots of Four-Point Galvanized Barb Wire, 4¼¢.

MISCELLANEOUS PRICES.

The Tuck Mfg. Company, Brockton, Mass., quote the Pelican Lawn Clipper at $4, subject to a discount on one, two or three cases, of 25 per cent., and on four or more cases of 25 and 10 per cent. The discount on samples is 15 per cent. These articles are packed in cases of half dozen each, no charge being made for packages.

The Unique Screw-Holding Screw-driver, described on page 23, and put on the market by the Alford & Berkele Company, 77 Chambers street, New York, is sold at $6 per dozen, subject to a discount to the trade of 25 per cent.

Advices are to the effect that the Stock and Die market is characterized by a good tone and with a fair demand for goods. Prices are, however, referred to as very low, and the only hope there is of improvement in the near future is dependent on the reaching of an understanding between the manufacturers whose competition is still animated.

At their meeting last week, while it was not found feasible to carry out some plans which had been under consideration, the manufacturers of Augers and Bits agreed upon an extreme figure beyond which sales are not to be made. The extreme price thus determined upon is something of an advance upon the lowest prices which have recently prevailed, but is somewhat lower than the nominal limit which had previously been named. As the new price is thus an advance on figures which have recently been the basis of transactions, the market may be regarded as in a somewhat better condition. The hope is expressed by the manufacturers that it may be found feasible to adhere to the price thus determined upon, which is certainly low enough in view of the cost of manufacture.

The market for Tackle Blocks shows no sign of improvement, and prices are irregular and low, there having been a further settling in quotations within a short time.

Planes are held steadily at the prices which have recently ruled, which, it will be remembered, are somewhat higher than the extreme figures at which they were sold shortly after the breaking up of the combination. The prices are, however, referred to as unprofitably low. The volume of business has been good.

In view of reported irregularities in Cast Butts, the market is in an unsettled state. Some of the manufacturers are said to have failed to receive their share of orders, on account of concessions beyond combination rates made by their competitors. It remains to be seen whether action can be taken to correct this condition of things, or whether there will be an open break in the market.

A decline has taken place in Rope, both Manila and Sisal, the former being quoted in the manufacturers' list at prices ½¢ lower than those which have recently prevailed, and the latter at prices ¼¢ lower. The revised list is as follows, which is subject to the discount to dealers of 1¢ per pound.

		Per lb.
Manila	½ inch and larger.	12½
Manila	⅜ inch.	13
Manila	¼ and 5-16 inch.	13½
Manila Tarred Rope		12
Manila Hay Rope		12½
Sisal	½ inch and larger.	12
Sisal	⅜ inch.	12½
Sisal	¼ and 5-16 inch.	13
Sisal, Hay Rope		12
Sisal, Tarred Rope		11½
Sisal, Single Ply Lath Yarn		11½

In view of the fact that the existing organization among the manufacturers closes July 31, there being some uncertainty as to whether or not it will be continued, it is thought not unlikely that low prices will be made in the near future. It is, however, to be remembered that the manufacturers may decide to continue the pool and avoid any important break in prices. The supply of Hemp, both Manila and Sisal, is referred to as likely to be quite large.

A revised list of Enameled and Tinned Hollow-Ware has been issued, in which some sizes of Maslin Kettles, &c., are listed at revised prices. No change in discounts is reported.

Wire Nails continue without change, the prices being somewhat irregular. An active competition exists among the manufacturers, and Standard Wire Nails are sold at what are regarded as low prices.

The Triumph Toy Clothes Wringer, a description of which is given on page 23, and which is made by the Triumph Wringer Company, Keene, N. H., is sold at $10 per dozen, subject to a discount of 50 and 10 per cent. in dozen lots, a discount of 65 per cent. being made in gross lots. These prices include delivery.

Announcement is made by the manufacturers of Indurated Fiber Goods that while adhering to a uniform schedule of prices they have found it difficult to secure a maintenance of card rate by dealers, and for the mutual protection of dealers and manufacturers the marketing of the entire output of Indurated Fiber goods will hereafter be done through the Union Indurated Fiber Company, whose New York office and salesroom is 110 Chambers street. The following manufacturers unite in this action and announcement:

INDURATED FIBRE COMPANY, Portland, Me.
JOHN H. CONANT, Watertown, Mass.
AMERICAN INDURATED FIBRE COMPANY, Mechanicville, N. Y.
OSWEGO INDURATED FIBRE COMPANY, Oswego, N. Y.
THE INDURATED FIBRE COMPANY OF LOCKPORT, Lockport, N. Y.
THE WESTERN INDURATED FIBRE COMPANY, Winona, Minn.

It is stated that this action has been deemed doubly essential, as it has been found necessary to advance rates to insure a fair profit in the manufacture of the goods, and a new price list is accordingly announced. It is the intention of the company to carry a full line of goods made at the different factories, at the office named above, as well as in Chicago at 73 Randolph street.

Some irregularities are reported in Wrought Iron Pipe owing to concessions made by some manufacturers.

ITEMS.

The Prentiss Vise Company, 23 Dey street, New York, have just issued a new illustrated catalogue and price list of their Vises, in which the different patterns that they make are represented. They also call prominent attention to their line of new Rapid Transit Vises, of which full descriptions are given, with an explanation of their mechanism. They also illustrate a line of Wrought Iron Patent Solid Box Vises, and Horseshoers' Vise and Anvil Combined. The pamphlet is clearly and neatly printed, and will serve the convenience of the trade.

The trade will observe on page 40 the illustration of the Davis Automatic Sash Lock, which is now put on the market by Sise, Gibson & Co., 100 Chambers street, New York. Their No. 230 is now ready. It is real bronze, plain, and listed at $9 per dozen, subject to a discount of 50 per cent. Other styles, it is expected, will be ready in a short time. It will be remembered that we gave a description of this Sash Fastener in our issue of November 18, 1886, but since then some modifications have been made in its pattern, and some new features added which are referred to as increasing its desirability. The point is emphasized that it is self-locking at the meeting rails. When the window is open the lever is held up by a trip, and in closing the window strikes the trip and releases and lets fall the lever fastening the window. It is specially pointed out that it will lock even if the window is not entirely down, or if the top sash drops a little. A side motion of ½ inch, which is common in old windows, is also provided for. It is claimed that it will fasten itself where an ordinary Sash Fast would not work at all. It is also referred to as unpickable, simple and durable.

Hardware manufacturers or jobbers desiring the services of a gentleman who is recommended as an experienced and thoroughly competent salesman or traveler, would do well to refer to the advertisement signed "Cupboard Catches" on page 25. The party is highly endorsed by some of the best houses in the trade.

John Chatillon & Sons, 85 to 89 Cliff street, New York, are agents for Foster Bros., Fulton, N. Y., prices on whose line of Butchers' Cleavers, Butcher Knives, &c., were given in our last issue.

The trade will observe with interest the announcement on page 31 in which the Newark, Ohio, Wire Nail Company call attention to their line of Brass and Copper Wire Cloth and other goods of their manufacture. Of this company, who have recently been formed, Chas. Kibler, Jr., is president, John S. Bradley, vice-president, L. F. Tenney, treasurer and F. R. Minckler, secretary. The company will have the best wishes of the trade for their success in this new enterprise.

Our readers will observe the special notice on page 24, in which the Board of Trade, of which Hon. G. B. Seaman is president, Avoca Post Office, Pa., calls attention to Pleasant Valley, near Scranton, as presenting superior advantages for manufacturers.

Trade Report.

Samuel A. Haines, 90 Chambers street, issues a card giving the following revised list of manufacturers of Nails and Hardware whom he represents direct. It will be observed that they include many leading lines and well known makers:

Bellefonte Iron and Nail Company, Cut Nails and Spikes.

Phillips, Townsend & Co., P. & T. Steel Wire Nails, Smooth and Barbed.

L. M. Dayton, Carriage Bolts, Machine Bolts, Lag Screws, Tire Bolts, Plow Bolts, Heel Bolts, Grass Rods, Steel and Iron Harrow Teeth and Screw and Strap Hinges.

Townsend, Wilson & Hubbard Bolt Company, Eagle Carriage Bolts, Norway and Charcoal Iron and Star Axle Clip.

James McKay & Co., Proof, Coil, Crane and Railroad Chain.

Logan & Strobridge, Coffee Mills and Cast Goods.

Dille & McGuire Mfg. Company, the Richmond Star Lawn Mower, the Diamond Lawn Mower.

Jeffords Axe Company, Axes, Single and Double Bit, Mattocks, Grub Hoes, R. R. Picks, Boys' Axes, Bench and Broad Axes.

Norfolk Shear Company, Shears, Scissors and Trimmers, Nickel Plated and Japanned.

E. Jenckes Mfg. Company, Bright Wire Goods, Belt Hooks, Spring Pins and Keys.

Starr Bros. Bell Company, Patent Gong Bells, Hand Bells, House Bells, Sleigh and Chime Bells.

H. Chapin's Son, Rules, Planes, Gauges, Plumbs and Levels, Handles, &c.

Reed & Prince, Norway Iron Rivets and Burrs.

Mr. Haines has just started on a Western trip and will represent the above manufacturers to the trade of the leading cities.

The Reading Lock Mfg. Company, Reading, Pa., successors to the Manhattan Hardware Company, a new concern recently organized, will continue to manufacture the same style of Locks, Latchets, and Broughton's Burglar Proof Sash Fasteners, under the patents held by the late Manhattan Hardware Company. Their announcement will be observed on page 36.

The Union Hardware Mfg. Company, Detroit, Mich., issue an attractive catalogue and price list of the line of Builders' Hardware which they are making. They direct the attention of the trade especially to their new ornamental iron and genuine bronze butts, and also to the new styles of locks and door knobs, to the finish of which they allude. They also refer to their largely increased facilities for manufacture. Edwards & Marvin, 103 Chambers street, New York, are their agents for the East and South, and also represent a number of other manufacturers, and, for the convenience of the city and near-by trade, they carry a complete stock.

George K. Oyler, successor to the Geo. K. Oyler Mfg. Company, St. Louis, Mo., has issued a catalogue for the current year, which describes the line of rolling colters, colter blades, &c., which he is making. It is accompanied by a sheet of quotations, in which list prices and discounts are given. Another circular relates to the line of buggies which Mr. Oyler is putting on the market.

Some of the Chicago detectives have recently exposed one of the means by which street fakirs get stocks of knives to sell at such cheap rates. Henry Sears & Co., dealers in wholesale cutlery at Nos. 75 and 77 Wabash avenue, Chicago, were robbed in November last of $500 worth of merchandise, the succeeding month of a similar amount, and again last Tuesday they lost $1500 worth of cutlery. The robberies were all committed in the same manner. A light wagon which is used by their salesmen is often left standing in front of the store, and at these different times four or five large rolls of cutlery were taken from the wagon. Detectives have recovered most of the property, and have under arrest a man charged with receiving the property knowing it to be stolen. When arrested he had 260 of the knives upon his person, the other knives having been purchased by street fakirs and exposed for sale on Clark and State streets.

The Rector & Wilhemy Co., Omaha, Neb., issue a price current, in which they display a variety of seasonable goods, with tinners' tools, and some specialties and staple lines. List prices are given with the discounts in characters, a key to which is furnished on an inserted slip.

Bullard & Gormley, Chicago, Ill., have purchased the entire right to manufacture the Barnard door holder and the Protection door guard, and are putting them on the market under the name of the Washburn Mfg. Company, 108 Lake street, Chicago. The Barnard door holder is especially intended to hold school, church or office doors in a fixed position when open, and can be easily attached, no matter at what angle the door strikes the opposing wall. The Protection door guard is intended to securely hold a door ajar, and it cannot be opened from the outside. It is described as very strong, ornamental and easily applied.

The Goshen Scrub Brush Company, of Goshen, Ind., manufacture a new scrub brush intended to supersede the hand brush which makes it necessary to crawl over dirty floors to clean them. The Goshen brush is composed of a brush 6 x 8 inches in size, having a handle almost 4 feet long attached to it by a thumb-screw. No stooping is needed in using this brush, and it is quickly adjusted to any position by simply turning a thumb-screw. This brush was patented on March 8, 1887, and has already been extensively introduced.

The Rogers Silver Plate Co., Danbury, Conn., have been organized with D. E. Rogers, president, and F. A. Hull, treasurer, and N. Burton Rogers, late of Meriden, secretary and superintendent. Their announcement in regard to the line of goods they are putting on the market will be found on page 36.

Announcement is made, May 24, that the co-partnership existing under the firm name of J. E. Quackenbush & Son, 313 West Thirty-seventh street, New York, has been dissolved by mutual consent, J. E. Quackenbush retiring. The business will be continued by Abraham Quackenbush under his own name, and he will liquidate the affairs of the old firm.

The Baker Chain and Wagon Iron Mfg. Company, Allegheny, Pa., issue the following circular relating to the recent destruction of their works at Beaver Falls, and the increased facilities which they will have for the production of their goods under the new arrangements which they have made:

On account of the total destruction of our works by fire on May 11, we have decided to move to Allegheny, Pa., adjoining one of the extensive rolling-mill plants of Oliver Bros. & Phillips, at which place we now have 36 chain fires working full time, in a fire-proof building, and have machinery on the way sufficient to enable us to produce our full line of specialties. In two weeks our capacity will be as great as ever: In addition to our former line of Baker Clips, Ferrules and Hooks, Single and Double-tree Irons, Neck Yoke attachments, Ironed Single-trees and Double-trees, Box Rods, with malleable collar, Seat Hooks, Clevices, Box Staples made of bevel-edge Steel, Double-tree Plates, Coupling Plates, Tongue Plates, Neck-yoke Plates. We now make a full line of washers from $\frac{3}{16}$ inch up to 3 inches. We ask you not to make any orders for goods in our line until after hearing from us. After June 1 our address will be Allegheny, Pa.

Announcement is made, Jackson, Mich., May 21, that E. R. Warner and G. A. W. Dodge have renewed the co-partnership which existed between them for the 17 years previous to the 1st of February last, and will continue the hardware business as heretofore at the old stand, 142 West Main street, which has recently been conducted by G. A. W. Dodge, and also at 188 West Main street, which has, since February 1, been conducted by E. R. Warner.

The Harrington & King Perforating Company, of Chicago, since they have obtained control of the perforating department of the Central Stamping Company and James Aikman & Co., of New York, and have removed the machinery to their works in Chicago, are now able to turn out work with greater promptness than ever by reason of these increased facilities. But as the process is necessarily a slow one, they urge customers to anticipate their requirements by as long a period as possible. They state that they have dies for all sorts of openings for which there is any demand, and of all sizes, as well as many odd and extra sizes in both fine and heavy work.

At a meeting held in Buffalo on the 27th ult., for the purpose of organizing a business men's association, with a view to promoting the industrial development of the city and the making known of its advantages as a commercial, mercantile and manufacturing center, a large number of representative business men assembled. All the leading industries and business enterprises of the city are reported to have been represented, and the meeting is characterized as enthusiastic and successful. In the report of the meeting addresses are given of a number of prominent citizens, and among them Walter J. Shepard, of the Shepard Hardware Company, is referred to as having made a telling speech, which was heartily applauded. In the abstract which is given of it, it is said:

He related an incident showing the Western idea of getting Eastern capital. A Boston bank sent a draft for $1000 to a bank in a small Minnesota town for collection. It came back with $10 deducted for "exchange." The Boston bank called a meeting of its directors at once to protest against such an exorbitant fee, and the aged cashier was instructed to write a lengthy letter to the Western bank expressive of their indignation. He did so, and the reply came back on a postal card, "We are not out here for our health." (Laughter). Mr. Shepard exhibited a copy of *The Iron Age* containing a large number of advertisements of booming Western towns, each claiming to be the healthiest place in the world. He knew a Buffalo firm which received the following letter from a Western town: "How much bonus, cash, do you ask to remove your business to this city?" Buffalo must advertise. If she has a good thing she must let the world know it. The people who are here must be treated so well that they will stay, and others must be cordially invited to come.

The following dispatch to the Boston *Herald*, May 27, refers to the difficulties encountered by the striking plumbers of New Haven, Conn:

The New Haven plumbers, who have been on strike for several weeks, recently decided to open a shop on the co operative plan. At the outset they have met with an unexpected difficulty. Two of the organizers called at Mersick's hardware store to purchase materials and were refused a price list. Peck Bros., another large hardware firm, also made a similar refusal. Mr. Mersick agreed to sell for cash, but at higher than the usual rates to the trade, and Peck Bros. would not sell unless a business card was shown, or until the strikers gave the location of their proposed place of business. The strikers claim that this is a boycott started by the builders' exchange, with the design of preventing them from starting in business. A member of the exchange denied this to-day, and said that Mr. Mersick and Peck Bros. acted on business principles in declining the custom of irresponsible parties who are not yet established in trade, and, therefore, not entitled to any more consideration than any other retail buyers of unknown credit. He added that they could buy for cash at retail rates, of course, but ought not to expect trade rates until they could show that they were entitled to them. Real estate and building operations are greatly depressed in New Haven by the strike of the plumbers and carpenters, and several large capitalists who had arranged to build this season will postpone the work until next year.

Combination Pipe and Bench Vise.

The Armstrong Mfg. Company, Bridgeport, Conn., manufacturers of water, gas and steam-fitters' tools, are introducing a combination pipe and bench vise, two views of which are presented in the engravings shown herewith. The vise is provided with detachable sockets for legs, and can be used on a bench and as a portable vise with stand, by using 1¼-inch pipe for the legs. The first engraving represents one side of the vise as it would be arranged upon a bench, while the second shows the opposite view employing the legs as above suggested. The parts of which the vise is composed are clearly indicated in the engraving. The jaws slide upon ways and are actuated by a screw. The pipe grip is made of three sections, two of which are on one side of the vise and one on the other, and the adjustment is such that the latter works between the former, thus admitting of the clamping of any size of pipe whatsoever. The jaws are so arranged at the top as to be adapted for the usual purpose for which a vise is used. An idea of an attachment at the back of the vise is conveyed by both of the cuts, by which the back jaw is set up, approximately to the point required, leaving only the tightening to be done by the screw. The article seems to be well made and well adapted for the purpose in view.

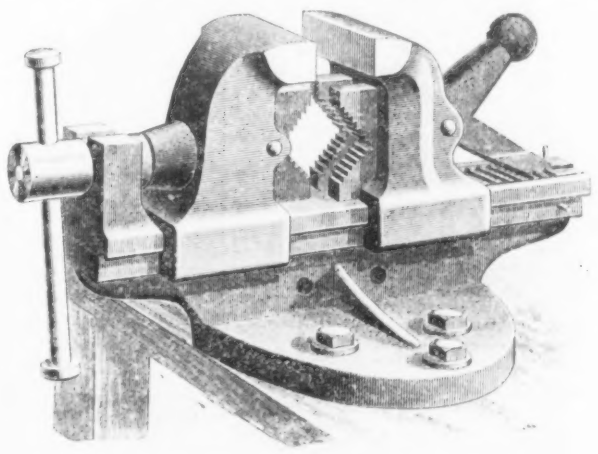


Fig. 1.—Combination Pipe Vise, Shown in Position on Bench.

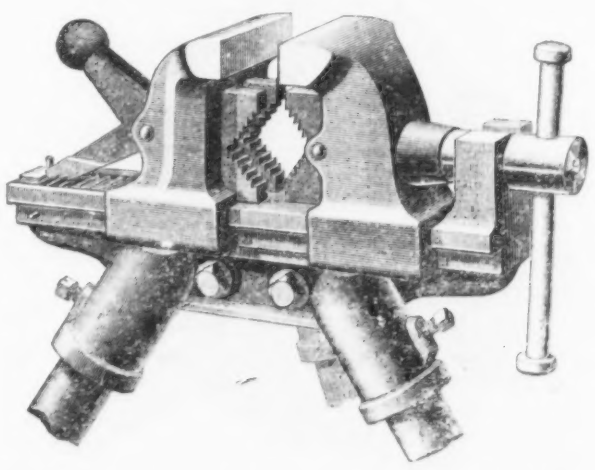


Fig. 2.—Opposite View of Pipe Vise, Using Gas Pipe for Legs.

COMBINATION PIPE AND BENCH VISE, MADE BY THE ARMSTRONG MFG. CO., BRIDGEPORT, CONN.

On the 27th ult. a meeting of prominent business men of Chicago was held at the Grand Pacific Hotel for the purpose of organizing one of a syndicate of five fire insurance companies, to be operated on the mutual plan. The companies, which are to be organized simultaneously in Chicago, New York, Boston, Philadelphia and St. Louis, are to have a paid cash capital estimated by experts to return the stockholders not less than 12 per cent. per annum, and at the same time reduce the cost of insurance not less than 30 per cent. The system is claimed to have a precedent in the factory mutual insurance companies of New England, which have been in successful operation since 1835. The net results of the system are stated to be the complete elimination of dangerous moral hazard and the reduction of expenses to a minimum. The maximum subscription to the capital stock by one person or firm is fixed at $10,000, and each stockholder will be required to hold policies of insurance.

A meeting of the sheet iron manufacturers was held at the Chamber of Commerce, Pittsburgh, on the 26th ult. The meeting was largely attended, representatives being present from all over the country. The meeting was called for the purpose of discussing and considering the alarming increase in the importation of tinned sheets and sheet iron. The question of undervaluation of these goods was also considered, and it was determined to take such steps as might be necessary to prevent, if possible, the further undervaluation of this class of goods. An organization was effected to be known as the Sheet-Iron and Sheet-Steel Manufacturers' Association. The following officers were elected: W. H. Everson, president; N. E. Whittaker, vice president; C. Meyran, treasurer, and Jos. D. Weeks, secretary. The object of the organization is not to influence prices, but to regulate production of sheet iron. The statements in the Pittsburgh papers to the effect that a pool will be formed are without foundation. Another meeting of the association will be held at an early date.

Liability of Mercantile Agency.

Judge Van Syckel, of the Court of New Jersey, has just filed an opinion in the Court of Errors dissenting from the majority of the judges in banc in their affirmation of the judgment of a lower court in a case against a mercantile agency for defamation and injury to credit in their publications. He claims in his opinion that the publication was made in good faith and was a privileged communication. Mercantile agencies, he said, are beneficial instruments in the conduct of business, and so long as reasonable care is taken that information concerning the credit of dealers does not extend beyond those entitled to it these agencies cannot be held for libel. Continuing, he said: "Business methods have changed. Every department of human activity is marked by progress. There must be a correct apprehension of legal principles as they apply to a progressive state of society if they would keep pace with the march of events and render the common law as true and unerring a guide in jurisprudence to-day as it has been in the past. It is the pride of the common law that it is sufficiently broad and elastic to adapt itself to the exigencies of the times and to adjust itself to the new and ever-varying conditions that may arise in the progress of the age. The rule that a business man may inquire of his friend as to the responsibility of one who has applied for credit answered well enough 50 years ago, but it is altogether inadequate to the present requirements of trade and commerce. The law in the oft-quoted case of Sunderland vs. Bradstreet would even suppress the prevalent practice in business circles of employing a credit clerk to ascertain and report the standing of business men in the district which he canvasses. No man could safely answer his inquiries, and the clerk would not report to his employer without being liable to prosecution. The old adjudications relied upon to support the more narrow rule are the declarations of judges whose vision did not take in the widely differing conditions which prevail in the affairs of men to-day. This document utterly disables the agency to become capable of imparting even the information which it is conceded may lawfully be given. If the agency may furnish only to one having a direct interest, how would any one dare give the information to the agency, for until some one having such interest has applied to the agency the communication is within the prohibited class."

The Enterprise Mfg. Company, of Philadelphia, are making a considerable addition to their foundry, which when completed will enable them to work about 90 molders. This company now employ 700 hands all told, which, as iron workers, is probably second only to the Baldwin Locomotive Works, who employ 3000. The development of business in Philadelphia has been enormous within the past ten years, many concerns having more than doubled their capacity, while some that formerly employed tens and twenties now employ hundreds of hands. Building operations at this time are greater than at any previous time in the history of the city.

Laying off Boilers.

Referring to proper methods of caring for boilers when out of use the Boston *Journal of Commerce* says:

A great number of methods have been recommended for adoption when a boiler is to be laid off. All sorts of swill has been recommended to put into it, it has been advised to paint the boiler inside and out, squirting the paint on with a syringe where a brush cannot be manipulated, and that determined enemy of the boiler, scale, has been called in to protect it, some authors advising that the surfaces of the interior of the boiler be covered uniformly with a very thin scale not thick enough to be cracked by the alternate expansion and contraction of the surfaces, nor to interfere materially with the steaming capacity of the boiler. The *modus operandi* of forming scale of this particular thickness, and keeping it at that point, is not given. Another method is to fill the boiler nearly full of water and finish filling with oil. Then draw of the water and as the level lowers the oil will come in contact with every portion of the boiler leaving a film upon it. We should place more reliance upon this if the oil came in contact with dry instead of wet sheets.

The two principal methods between which opinion appears to be divided at present are known as the wet and the dry methods. In the wet method the boiler is filled completely full of clean water and all inlets and outlets made tight. In this condition, and in most instances, the interior of the boiler appears to be well preserved, but sweating, or the deposit of moisture from the air upon the external surfaces takes place whenever the temperature of the water becomes as low as the dew point, and serious cases of external corrosion have been induced in this manner. What appears to be the most preferable in the majority of instances is the dry method, which consists in thoroughly draining the boiler out to the last drop and taking proper precautions to see that no water can leak or accumulate in it. Then all the hand-holes or man holes are taken out to admit of a free circulation of air. Any mass of sludge or deposit, which would act as an accumulator or retainer of dampness, should be removed, though if any of the surfaces are covered with a thin hard scale it had better not be removed until the boiler is again put into use, as it is an efficient protector to the plate. When the boiler is thoroughly emptied and cleaned and the hand and man-hole covers removed the sheets may be warmed and dried by placing pans of burning charcoal on the grates, or lighting a light shaving fire in the ash pit, and if the boiler is in a damp situation this drying should be repeated as often as may be necessary to keep the boiler dry and clean.

The Coke Strike.

The principal event of interest since our last issue relating to the coke strike now pending was the meeting of the furnacemen which was held at the Monongahela House in Pittsburgh on the 25th ult. Representatives from the Shenango and Mahoning Valleys, Pittsburgh and Wheeling were present. It was a special meeting and had been called to decide upon united action in a protest against the present price of coke. E. E. Wheeler, of Sharon, Pa., was appointed president, and Robert Bentley, of Youngstown, Ohio, acted as secretary. After a long discussion on matters of interest to those present at the meeting, the following resolutions were unanimously adopted:

Resolved, That a committee of five be appointed by the chairman of this meeting, to make a demand upon the coke syndicate that the price of coke be reduced to $1.50 per ton, f.o.b. at mines, from and after June 1.

Resolved, That the committee be authorized to make a demand upon transportation lines for lower rates of freight than now prevail.

Resolved, That this meeting shall adjourn to meet at this place on Wednesday, June 1, to hear the report of the committee and take such other and further action as may be deemed necessary to secure said lower rates.

The resolutions as adopted were presented to the coke syndicate at a meeting held at its headquarters on the 27th ult. Contrary to general expectation, the syndicate declined to grant the demand made by the furnacemen that the price of coke be reduced to $1.50 per ton. They gave as a reason that on account of the present strikes among the employees that they had no coke to offer at any price, but when work was resumed and the present difficulties adjusted they would take the matter under consideration. On the 23d ult. W. J. Rainey, a large operator in the region, notified his men that he would grant the advance. This is the first serious break made by the operators. Mr. Rainey is not a member of the syndicate, and the latter body condemn his action in very strong terms, but claim it will have no effect in a settlement of the strike.

Two members of the General Executive Board of the Knights of Labor have been investigating the coke strike, with the avowed object of ordering the men in if their finding as to the facts sustains the arbitrators' award. The feeling seems to prevail that the strike is not likely to be of long duration.

The Chicago, Rock Island and Pacific Railroad Company have established a regulation that will be greatly appreciated by persons living along their line. Agricultural implements, machinery and vehicles returned to factories for repairs will be transported at one-half tariff rates if they were originally shipped over that road.

An increasing demand for vessels for the Lake Superior ore trade is reported from the cities on the Great Lakes, and charters are advancing to a point which will withdraw many of them from the grain trade.

WHOLESALE METAL PRICES, JUNE 1, 1887.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 1 1-10¢ ℔ lb; provided that no Bar iron shall pay a less rate of duty than 35 %. Sheet, 1 1-10¢ to 1 5-10¢ ℔ lb. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ℔ lb. Railroad Bars weighing more than 25 lb ℔ yard, 7-10¢ of 1¢ ℔ lb.

Standard American Pig Iron.

Foundry No. 1 X	℔ ton	$21.00 @ 21.50
Foundry No. 2 X	℔ ton	19.50 @ 20.50
Gray Forge	℔ ton	18.00 @ 19.00

No. 1 Scotch Pig Iron.

Carnbroe	℔ ton	$21.50 @ 22.75
Coltness	℔ ton	22.00 @ 23.50
Shotts	℔ ton	21.75 @ 22.00
Glengarnock	℔ ton	20.25 @ 20.50
Gartsherrie	℔ ton	21.00 @ 21.50
Langloan	℔ ton	22.00 @ 22.50
Summerlee	℔ ton	21.50 @ 22.00
Dalmellington	℔ ton	20.50 @ 21.00
Eglinton	℔ ton	20.00 @ 20.50
Clyde	℔ ton	20.00 @ 20.50

Rails.

Steel, at Eastern mills	℔ ton	$38.00 @ 40.00
Old Rails, Ts	℔ ton	21.50 @ 22.00

Scrap.

Wrought, ℔ ton, from yard		$22.50 @ 23.00

Bar Iron from Store.

Common iron: ¾ to 2 in. round and square; 1 to 6 in. x ⅜ to 1 in	℔ lb	2.20 @ 2.30¢
Refined Iron: ¾ to 2 in. round and square; 1 to 6 in. x ⅜ to 1 in	℔ lb	2.40 @ 2.60¢
1 to 6 in. x ¼ and 5-16	℔ lb	2.60 @ 2.80¢
Rods—⅝ and 11-16 round and sq	℔ lb	2.50 @ 2.70¢
Bands—1 to 6x3-16 to No. 12	℔ lb	2.60 @ 2.70¢
"Burden's Best" Iron, base price	℔ lb	3.50 @ ....
Burden's "H. B. & S." Iron, base price	℔ lb	3.00 @ ....
Norway Rods		5 @ 6¢

Sheet Iron from Store.

		Common American.	R. G. Cleaned.
10 to 16	℔ lb	.... @ 2.85¢	3½¢
17 to 20	℔ lb	2.95 @ 3.00¢	3½¢
21 to 24	℔ lb	@ 3½¢	3½¢
25 and 26	℔ lb	3.25 @	3¾¢
27	℔ lb	.. @ 3¾¢	4 ¢
28	℔ lb	... @ 3½¢	4 ¢

		B B	2d qual.
Galvanized 16 to 20	℔ lb	4.80¢	4½¢
Galvanized 1 to 24	℔ lb	5.20¢	4⅞¢
Galvanized, 25 to 26	℔ lb	5.60¢	5¼¢
Galvanized, 27	℔ lb	6 ¢	5⅝¢
Galvanized, 28	℔ lb	6.50¢	6 ¢
American Russia	℔ lb	A 10¢	B, 9¢
Russia	℔ lb	9½¢ @	10 ¢
American Cold Rolled B. B.	℔ lb	5 ¢ @	7 ¢

Iron Wire.—(*See Wire.*)

STEEL.—DUTY. Ingots, Bars, Sheets, &c., valued at 4¢ ℔ lb or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ℔ lb, 2¢ ℔ lb; valued above 7¢ and not above 10¢ ℔ lb, 2¾¢ ℔ lb; valued above 10¢ ℔ lb, 3¼¢ ℔ lb. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1¼¢ ℔ lb in addition to above; Steel Circular Saw Plates, 1¢ ℔ lb in addition to the above.

American Cast Steel.

For American Steel see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes, ⅝ to 3 inches, net		10 @ 14¢
Adamantine Shoes and Dies		8 @ ..¢
Magnet Steel		14 @ ..¢

English Steel.

Best Cast	℔ lb	14½ @ 15 ¢
Extra Cast	℔ lb	16½ @ 17 ¢
Circular Saw Plates	℔ lb	14 ¢
Swaged, Cast	℔ lb	16 ¢
Best Double Shear	℔ lb	15 ¢
Blister, 1st quality	℔ lb	13 ¢
German Steel, Best	℔ lb	10 ¢
2d quality	℔ lb	9 ¢
3d quality	℔ lb	8 ¢
Sheet Cast Steel, 1st quality	℔ lb	15 ¢
2d quality	℔ lb	14 ¢
3d quality	℔ lb	12½¢

TIN.—DUTY Plates, Sheets, Tagger and Terne, 1¢ ℔ lb; Bars, Block and Pigs free.

Banca	℔ lb	24¼¢ @ 24¾¢
Straits	℔ lb	23¾¢ @ 24¼¢
English	℔ lb	21 ¢ @ 21½¢
Bar	℔ lb	24½¢ @ 25 ¢

Charcoal Tin Plates.

C 10x14 225 sheets	℔ box	$5.00	@ 6.87½
C 12x12 225 sheets	"	5.00	@ 6.87½
C 20x28, 112 "	"	10.25	@ 14.75
X 10x14 225 sheets	"	6.00	@ 9.37½
X 12x12 225 sheets		6.00	@ 9.37½
X 14x20, 112 "		6.00	@ 9.37½
D C 12½x17, 100 "		5.00	@ 5.75
D X 12½x17, 100 "		6.00	@ 7.25
For each additional X add	"	1.25	@ 2.25

Coke Tin Plates.

	Best.	Ordinary.
C 10x14	$4.50	$4.40 @ 4.50
C 14x20		4.60 @ 4.65
C 12x12	4.75	
C 20x20, gutters, 225 sheets	8.00	7.25
C 20x28 112 sheets	9.00 @	.50

Terne Plates.

	Prime Char.	2d. quality
C 14x20 M.F. $6.50		$13.25
C 14x20 Old Process		6.50
C 20x28 "		13.25
C 14x20	$4.50 @ 4.75	4.37½ 4.25
X 14x20	5.75 @ 6.00	
C 20x28	8.80 @ 9.30	8.75 8.50 @ 8.70
X 20x28	11.00 @ 12.00	

Tin Boiler Plates.

IXX 14x26, 2 sheets for No. 7, 112 sheets		@ $12.00
IXX 14x28, 2 " " No. 8,	"	@ 13.00
IXX 14x31, 2 " " No. 9,	"	@ 15.00

COPPER.—DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ℔ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake	℔ lb	10½¢
Ingot, Baltimore		10 ¢
Ingot Anchor		10 ¢

Cold Rolled Sheet.

6 oz. per square foot, and heavier	℔ lb,	19¢
4 and 15 oz. per square foot	℔ lb,	21¢
12 and 13 oz. per square foot	℔ lb,	23¢
10 and 11 oz. per square foot	℔ lb,	24¢

TINNING.

Sheets, one side, 10, 12 and 14 x 48	each, 8¢
Sheets, one side, other sizes	℔ square foot 2½¢
For tinning both sides, double the above prices.	
For tinning boiler sizes, 9 in., 14 x 60	each, 15¢
For tinning boiler sizes, 8 in., 14 x 56	each, 12¢
For tinning boiler sizes, 7 in., 14 x 52	each, 12¢

Sheathing Copper. (14 x 48.)

	Hot Rolled.	Cold. Rolled.
16 oz. to sq. ft. and heavier, per lb.	18¢	19¢
14 oz. and up to 16 oz., per lb	19¢	20¢
2 oz. and up to 14 oz., per lb	20¢	21¢

Tinning, 6 cents each.

Copper Bottoms.

Pits and Flats, 14 oz	℔ lb	21¢
Pits and Flats, 12 oz	℔ lb	22¢

O'Neill's Patent Planished Copper. Net.

14x48

14 and 16 oz. and heavier 27¢	By the case	℔ lb 26¢
12 oz. and lighter 30¢	" "	" " 29¢

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.

and 16 oz. and heavier 29¢	by the case	℔ lb 28¢

And all sizes not over 20 lb ℔ wide.)

24x48 and 30x60.

and 16 oz. and heavier	℔ lb	31¢
oz	"	34¢

Planished Brass same price as Planished Copper

Copper Wire.—(*See Wire.*)

Sheathing Metal.

Yellow Sheathing Metal, ℔ lb		18¢ @ ...

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884 ..... dis. 20 @ 30 %

LEAD.—DUTY: Pig, $2 ℔ 100 lb; Old Lead, 2¢ ℔ lb; Pipe and Sheet, 3¢ ℔ lb.

Pig		4.80 @ 4¾¢
Bar		5¼¢
Pipe		7¢, dis 20 %
Block Tin Pipe		40¢, dis 20 %
Tin Lined Pipe		15¢, dis 20 %
Sheet		7¾¢, dis 20 %
Shot, ℔ bag, 25 lb	Drop, $1.40; Buck,	$1.65
Chilled Shot, ℔ bag, 25 lb		$1.65

ANTIMONY.

Hallett's	℔	7¾ @ 9 ¢
Cookson	"	9¼ @ 10 ¢

SPELTER—Duty: Pigs, Bars and Plates, $1.50 ℔ 100 lbs.

American, cash		4⅞ ¢ @ 5¢
Bergenport		7¾¢

ZINC—Duty: Pig or Block, $1.50 ℔ 100 lbs. Sheet, 2½¢ ℔ lb.

600 lb casks		6½ @ 6¾¢
Zinc.—Open		7 ¢
Zinc Tubing		dis. 10 @ 20 %

Zinc Tubing—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U.	℔ lb	6½ @ 28¢
X		.10¢
X X		.15¢
J. B.		.20¢

WIRE.

Market Wire.—Put up in 63 lb bundles.

Nos.	00 to 9.	10, 11.	12.	13, 14.	15, 16.	17.	18.
	10	11	11½	12½	14	15	16

Bright Market Wire	dis 67½ %
" Charcoal	dis 47½ %
" Bale Wire. Nos. 7 to 12	dis 62½ %
Annealed Market Wire; " Fence Wire, Nos. 8 and 9; " Grape Wire. Nos. 10 to 14	dis 67½ %
Coppered Market Wire	dis. 62½ %
" Bale Wire, Nos. 7 to 12	dis. 57½ %
Galvanized Market Wire; " Fence Wire	dis 57½%

Stone or Weaving Wire.

Nos.	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos.	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18	dis. 67½ @ 70 %
19 to 26	" 67½ @ 70 %
27 to 36	" 72½ @ 75 %
Galvanized Stone Wire	" 50 %

Steel Wire.

Cast Steel, Steel Wire list	dis. 50 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20 @ 25.

	Common High Brass	Low Brass	Gilding Bronze and Copper.
All Nos. to No. 16, inclusive	$0.22	$0.26	$0.30
No. 17 and 18	.23	.27	.31
" 19 and 20	.24	.28	.32
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.82
" 34	.64	.68	.95
" 35	.70	.74	1.30
" 36	.76	.80	1.50
" 37	1.00	1.04	1.79
" 38	1.30	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance. Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more, 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

½ & ½. Warranted	15¼ @ 15½¢
Extra	14¼ @ 14½¢
No. 1 Refined	12¾ @ 13 ¢
No. 2 Solder	12¾ @ 12½¢
Extra wiping	12 @ 12¾¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 55 %
In bulk, new list, Dec. 10, 1881	dis. 45 %
Copper Rivets and Burrs	dis. 50&10 @ 60 %

Nos.	7	8	9	10	11	12	13	14	1
℔ lb	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 65 %
R. B. & W.	dis. 67½ %
R. & E. Mfg. Co.	dis. 65&10 %

FRENCH GLASS.

January 27, 1885. Per Box, 50 feet

Single Thick.

Sizes.	1st. E F H	2d. I E H	3d. H H	4th. H B
25 6 x 8 to 10 x 15	$10.50	$9.00	$8.50	$8.00
40 11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50 18 x 22 to 20 x 30	15.50	14.00	13.00	12.50
54 15 x 36 to 24 x 30	16.50	15.00	13.50	
60 26 x 28 to 24 x 36	17.75	16.25	14.75	
70 26 x 36 to 26 x 44	19.00	17.50	15.25	
80 26 x 46 to 30 x 50	21.00	19.50	17.00	
84 30 x 52 to 30 x 54	22.00	20.25	18.00	
90 30 x 56 to 34 x 56	23.00	21.25	19.00	
94 34 x 58 to 34 x 60	24.00	22.75	21.00	
100 36 x 60 to 40 x 60	26.50	24.50	23.00	

Double Thick.

Sizes.	1st. E F H D	2d. I E H D	3d. H H D	4th. H B D
25 6 x 8 to 10 x 15	$13.00	$12.50	$12.00	$11.50
40 11 x 14 to 16 x 24	16.00	15.00	14.50	
50 18 x 22 to 20 x 30	20.50	19.50	18.50	
54 15 x 36 to 24 x 30	22.00	20.75	19.50	
60 26 x 28 to 24 x 36	25.00	23.00	21.50	
70 26 x 36 to 26 x 44	26.00	25.00	23.00	
80 26 x 46 to 30 x 50	28.00	26.50	24.50	
84 30 x 52 to 30 x 54	30.00	28.00	26.00	
90 30 x 56 to 34 x 56	31.00	30.00	28.00	
94 34 x 58 to 34 x 60	32.50	31.00	29.00	
100 36 x 60 to 40 x 60	36.00	33.50	32.00	

Sizes above—$15 per box extra for every 5 inches.
Discount 75&5 @ 75&10 %

PAPER STOCK, &c.

(*Dealers' Selling Prices.*)

	Cents	℔ lb.
White Shirt Cuttings, No. 1	6 @	6¼
" " No. 2	5 @	5¼
Mill Assorted Whites	4½ @	5
Unbleached Muslins	5 @	5¼
City Whites, No. 1	3⅞ @	4
City Whites, No. 2	1⅞ @	2
New Canton Flannels	4½ @	4¾
New Seconds, light	3¾ @	4
" dark	2½ @	2¾
Cotton Canvas	4⅛ @	4⅜
Linen Canvas No. 1	4 @	4⅛
Seconds, City No. 1	1¼ @	1⅜
Seconds, City No. 2	1 @	1¼
Colors, ℔ cwt	40 @	50
Manila Rope	2¾ @	2⅞
" Tarred	2½ @	2¾
Gunny Bagging, No. 1	1⅝ @	1¾
" No. 2	1⅜ @	1½
Kentucky Bagging	4 @	..
Burlap Bagging, No. 1	1¾ @	1⅞
Tar Shakings	1¾ @	2
Hemp Twine Stock	3¼ @	3½
Hard White Shavings, No. 1	3⅜ @	3¾
Soft White Shavings, No. 1	2½ @	2¾
White Shavings, No. 2, Soft	2¼ @	2½
Mixed Shavings, part White	1⅝ @	1⅞
Ledger and Writing	2⅜ @	2½
Solid Stock	1⅝ @	1⅞
Book Stock, No. 1, light	1 @	1⅛
Old Newspapers	1¼ @	1⅜
Pure Manilas	1½ @	1⅝
Bogus Manilas and Hardwares, cwt	60 @	100
Commons, ℔ 100 ℔	50 @	60
Binders' Board Cuttings	⅛ @	⅝
Straw Board Cuttings, ℔ cwt	65 @	75

PAINTS, OILS, &c.

Paints.

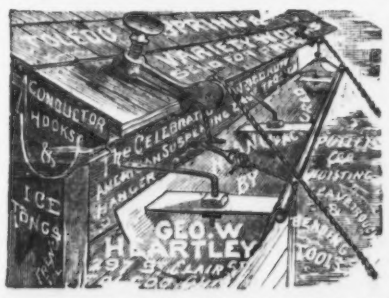
Black, Lamp—Coach Painters'	℔ lb	22 @ 24¢
Ordinary		6¢
Black Ivory Drop, fair		12 @ 15¢
Black Paint, in oil	kegs, 8¢; assorted cans,	11¢
Blue, Prussian, fair to best		40 @ 55¢
" " " in oil		45 @ 55¢
" Chinese dry		70¢
" Ultramarine		18 @ 30¢
Brown, Spanish		1¼¢
" Van Dyke		10 @ 12¢
Dryers, Patent American	asst'd cans, 9¢; kegs,	7¢
Green Chrome		15 @ 23¢
" " in oil		14 @ 18 @ 25¢
" Paris	good, 20¢; best,	25¢
" " in oil	good, 30¢; best,	35¢
Iron Paint, Bright Red	℔ lb	2¼¢
" Brown	"	1½¢
" Purple	"	3¢
Ground in oil, Bright Red		6½¢
" " Red		5½¢
" " Brown	"	5½¢
" " Purple	"	6¢
Litharge		6½¢
Mineral Paints		2 @ 4¢
Orange Mineral		10¢
Red Lead American		6½¢
Venetian (Eng.) dry		$1.65 @ $1.70
" " in oil	asst'd cans, 11¢; kegs,	8¢
" Indian Dry		9 @ 12¢
Rose Pink		10 @ 13¢
Sienna, American Raw, powdered		4¢
" Burnt, powdered		4½¢
" " in oil		10 @ 16 @ 20¢
" Raw		11 @ 15 @ 25¢
Umber, Burnt, powdered		4 @ 8¢
" " in oil		9 @ 12 @ 15¢
" Raw, powdered		4 @ 7½¢
" " in oil		9 @ 12 @ 15¢
Vermilion, Chinese		90¢
" English		55 @ 60¢
" American, Common		15¢
White Lead, American, pure dry		6¢
" " " " in oil		7 @ 7½¢
White Paris, English Prime		2 @ 2½¢
Yellow Ochre, French		$1.75
" " " in oil	asst'd cans, 11¢; kegs,	8¢
" " Vermont	in casks,	1½¢
Yellow Chrome		17 @ 27¢
" " in oil		14 @ 18 @ 20¢
Zinc White, American No. 1, dry		5 @ 6¢
" " No. 1, in oil		3¢
" French (Paris Dry)		5½ @ 7½¢
" " in oil		10 @ 11¢

Oils.

Bleached Whale, ℔ gal		40 @ 42¢
" Sperm, ℔ gal		63 @ 70¢
Fish Oil, Pressed		26 @ 26½¢
Lard, Prime Winter		57 @ 58¢
Cylinder Oil		70¢
Machinery		45¢
Engine		55¢
Linseed, Raw, in casks and bbls		@ 45¢
" Boiled, " "		@ 49¢
" Western, " "		@ 43¢
Neatsfoot		55 @ 75¢
Cotton Seed, Refined		40¢

Sundries.

Asphaltum, Cuban, ℔ lb		5½ @ 6½¢
" Egyptian		8 @ 9½¢
Benzine, 62°	℔ gal.	8½ @ 9½¢
Coal Tar	℔ bbl.	$3.00 and $4.00
Chalk, ℔ 100 lb		45¢
" Block		3¼¢
Crucibles No. 14 and upward, per number		33½¢
Grain Emery, 300 lb kegs		4 @ 4½¢
Flour Emery, finest quality		2½ @ 2¾¢
Frostings		30 @ 35¢
Glue, White		18 @ 35¢
" sheet		13 @ 20¢
Glaziers' Points, Zinc, ℔ box		$4.75
Gum, Copal		36¢
" Damar		25¢
" Shellac, English		30¢
" " " dark		25¢
Mineral Wool, ordinary, ℔ lb		1 @ 1¼¢
" " extra		3 @ 3½¢
Naphtha, 70°		9 @ 1½¢
Naphtha, 76°		9½ @ 10½¢
Pumice Stone, selected Lumps		3 @ 6¢
" " powdered		2 @ 2½
Pine Tar, bbls		$2 @ $2.25
Pitch		$1.40
Plumbago X. I. Po., ℔ lb		4 @ 6¢
" American, ℔ lb		3 @ 4¢
" Gun Powder Glazing, ℔ lb		10¢
" Shot Polish ℔ lb		10¢
Putty, in bladders		2½¢
" in bulk		1¾ @ 2
Rosin—Common and Good—Strained		$1.50 @ $1.52½
" E & F		$1.60 @ $1.72½
" G & H		$1.80 @ $1.90
" I & K		$2.00 @ $2.10
" M & N		$2.25 @ $2.60
Spirits Turpentine, ℔ gal		31½¢
Stove Polish, Dixon's	℔ gross	$5.50
" Rising Sun	"	5.50
" Gem	"	4.00
" Jet Black	"	3.00
Waste, No. 1 Cop		8¾¢
" No. 1 White Machine		8¾¢
" No. 2 White Machine		8¼¢
" No. 1 Colored		6¼c
" No. 2 Colored		5¾¢
" Washed Machine		8¼¢
Whiting, Spanish, ℔ 100 lb		50¢



The Woodruff's Patent Celebrated American Suspending Eave Trough Hanger. The Best in the World And Pulley for Hoisting Trough. "Little Giant" Combined Shear and Punch. Manufactured by Geo. W. Heartley, Toledo Spring and Variety Works, 300 St. Clair St., Toledo Ohio.

THE CHAMPION

The best general purpose Carriage Bolt for the money in the world.

Write for our new Illustrated Catalogue, embracing our full line of Bolts, Axle, Spring-bar and Saddle Clips, Shaft Couplings, Pole Eyes, King Bolts, Nuts and Carriage Forgings.

Columbus Bolt Works, Columbus, O.

Parties looking for a noiseless, economical and efficient Power will do well to send for descriptive *Catalogue, free.*

Amherst Hydraulic Motor Co., HOLYOKE, MASS.

All-Steel Bronzed.

FRANCIS AXE CO., Buffalo, N. Y.

Manufacturers of STANDARD and ALL-STEEL AXES.

Will make Special Prices on

AXES

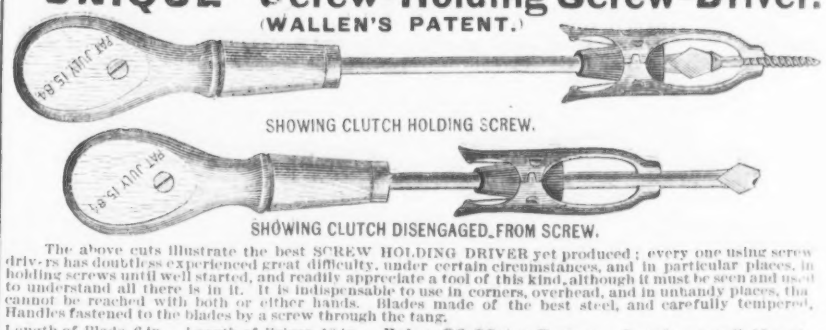
Ordered before July 1st.

Send for New Illustrated Catalogue. Order sample box of our New

"BUFFALO" BEVELED AXE.

"UNIQUE" Screw-Holding Screw-Driver.

(WALLEN'S PATENT.)



SHOWING CLUTCH HOLDING SCREW.

SHOWING CLUTCH DISENGAGED FROM SCREW.

The above cuts illustrate the best SCREW HOLDING DRIVER yet produced; every one using screw drivers has doubtless experienced great difficulty, under certain circumstances, and in particular places, in holding screws until well started, and readily appreciate a tool of this kind, although it must be seen and used to understand all there is in it. It is indispensable to use in corners, overhead, and in unhandy places, that cannot be reached with both or either hands. Blades made of the best steel, and carefully tempered. Handles fastened to the blades by a screw through the tang.

Length of Blade, 6 in. Length of Driver, 10 in. Price, $5.00 per Dozen. Discount per cent. Sample my mail, 50 cents

Manufactured by WALLEN & NESBITT,
The ALFORD & BERKLE COMPANY, Sole Agents,
P. O. Box 2002. 77 CHAMBERS STREET, NEW YORK.

MERRILL & WILDER'S EXTRA SOCKET FIRMER CHISELS.

SOLID CAST STEEL.

These Tools are tempered by an improved process, insuring a Perfect Cutting Edge.

THIS CUT ILLUSTRATES A NO. 10 SET IN FANCY BOX.

CONDITIONS OF WARRANTY:

We warrant all goods bearing our trade-mark to be perfect when they leave the shop, so far as the material and workmanship are concerned. If a tool proves too soft and bends on the edge or breaks in consequence of a flaw in the steel and is returned to the person from whom it is bought within thirty days from date of purchase, a new tool will be given in exchange. If it is broken where the steel is sound, it will not be exchanged.

Price, No. 10 Set: 12 Chisels from ⅛ to 2 inches (sharpened and set ready for use), in Fancy Wooden Box. $6.00

These Chisels can be obtained through any Wholesale Hardware House in the United States.

C. E. JENNINGS & CO., 79 Reade and 97 Chambers St.
NEW YORK CITY.

THE BOSTON KNOB CO.,
169 High Street, Boston.

Reduction in Price.

COLORS

CONSIDERED MOST DESIRABLE.

3. Garnet (Dark Cherry or Mahogany).
7. Olive (Dark).
8. Olive (Light).
10. Drab.
13. Brown (Light).
14. Brown (Light Cherry).

All Colors Warranted Not to Fade.

List Price $10 per Doz

Send for Illustrated Catalogue.

SHEPMAN & FEARING, 100 Chambers St., New York, General Agents.

W. BINGHAM & CO.,

MANUFACTURERS AND DEALERS IN

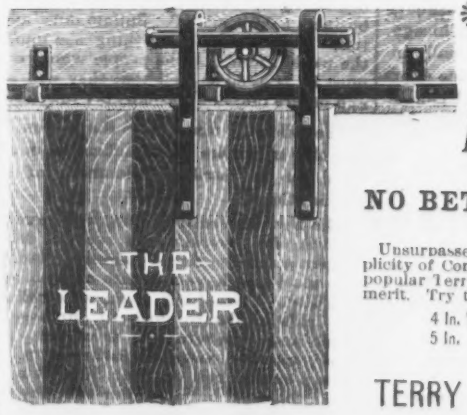
HARDWARE,

RAILWAY, MINERS', ENGINEERS', ARCHITECTS', MECHANICS', MACHINISTS' and FACTORY TOOLS and SUPPLIES.

146, 148 and 150 Water St., - CLEVELAND, OHIO.

ALEXANDER BROS
BEST OAK BELTING
PHILADELPHIA.

ELIZABETHPORT STEAM CORDAGE CO.,
MANUFACTURERS OF MANILA, SISAL AND TARRED
CORDAGE OF ALL KINDS.
E. M. FULTON.
D. B. WHITLOCK.
A. W. LUKENS.
BINDER TWINE A SPECIALTY.
46 South Street, NEW YORK.



THE LEADER

STEEL

Anti-Friction Hanger

NO BETTER HANGER MADE.

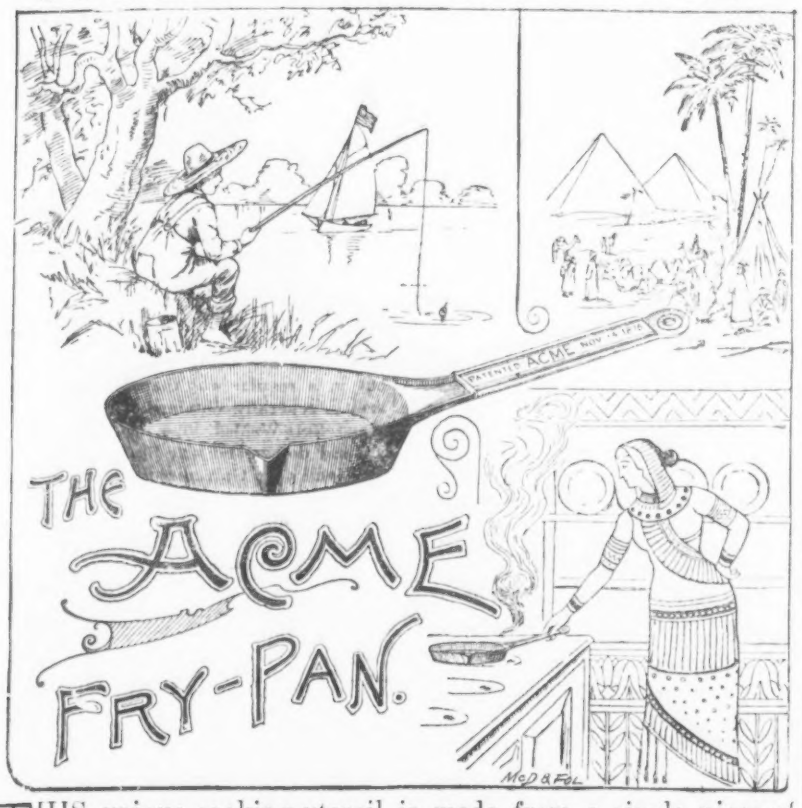
Unsurpassed for Strength, Ease of Working or Simplicity of Construction. Made of Steel and used on the popular Terry Steel Rail. A ready seller and full of merit. Try them. Write for discounts.

4 In. Wheel, 6 Ft. Run, $15.00 per doz. pair.
5 In. " 10 Ft. " 18.00 " "

Write for discounts.

TERRY MANUFACTURING CO.,
HORSEHEADS, N. Y.

"SOLD EVERYWHERE"



THIS unique cooking utensil is made from a single piece of the finest cleaned, and cold rolled iron, without rivets. The handle is reinforced with a tinned iron cover, which is hollow, ventilated, and keeps always cool.

For Sale by all Jobbers in Hardware and Tinners' Stock in the United States and Canada.

NEW YORK STAMPING COMP'Y

SOLE MANUFACTURERS,

47 to 53 S. Fifth St., Brooklyn, E. D., New York, U. S. A.

THE HAGUE

PATENT EXPANSION SHOE.

THE BEST SHOE IN THE WORLD.

For all Lameness in Horses' Feet, such as Contraction, Hoofbound, Corns, &c., &c., and cannot become displaced from the wall by the growth of the foot.

This Shoe will Positively Cure Contracted Feet.

J. B. HAGUE & CO., Manufacturers,

NAPOLEON, OHIO.

ALWAYS RELIABLE. —THE— NEVER FAIL.

IMPROVED

Anthony Wayne Washer.

This is the only Washer that will give entire satisfaction; it works easy, washes clean, does not tear the clothes and is the general favorite in every household. It is sold upon its merits. We solicit the correspondence of the trade. For prices, terms, &c., address

THE

Anthony Wayne Mfg. Co.,

FORT WAYNE, IND.

INTERIOR VIEW OF WASHER.

EXTERIOR VIEW OF WASHER.

HUGUNIN PAT. SCREW SASH BALANCES. Mechanical Substitutes for Weights, 2 widths. Sashes work as with weights. No clock springs or latches; are applied to the frame; work against the unpainted edges of the sash. No. 3, 1⅛ x ⅞ width; No. 2, 1⅛ x 1⅛; No. 1, 1⅝ x 1½: gray and Malleable iron. Remember *Robert B. Hugunin, Patentee and Solely Authorized Maker*, is cast on the face-plate of the genuine goods and by which they are instantly known. *The unimproved and unrecommended No. 2's* have been fraudulently copied, with date of my minor patent, Nov. 6, 1877,—*never used on the genuine*, and slyly sold by misrepresentations, *canvassing, circulars, dealers in snide goods*, to injury of buyer. Spot them. The *improved are made* under the care of the inventor and give satisfaction. For sale by the first class trade. Liberal discounts, according to quantity. Address, ROBT. B. HUGUNIN WINDOW FIXTURE MFG. CO., Hartford, Conn., U. S. A., manufacturers of Hugunin's Patent Sash Fixtures, both Balances and Sash Locks.

THE NEWARK, O., WIRE CLOTH CO.,

—MANUFACTURERS OF—

Brass and Copper Wire Cloth.

ALSO BRASS AND COPPER WIRE.

Brass Strainer Cloth a Specialty.

NEWARK, OHIO.

The Chicago Builders' Lockout.

The struggle now in progress between the Chicago builders and their workmen is unique. The bricklayers and stonemasons are on a strike, while the other craftsmen have been locked out until the whole building question can be readjusted. In order to conduct an effective campaign against the workingmen, the builders have enlisted the co-operation of material men of all kinds, so as to prevent the workingmen from forming combinations to conduct building operations, and also to prevent outside builders from taking advantage of the situation to get a foothold in Chicago. The workingmen claim that the Chicago builders are only partially successful in this respect, and that building materials can be procured from a few Chicago dealers and from neighboring cities in sufficient abundance to enable a great deal of work to be carried on. All that can be undertaken in this way, however, forms an insignificant part of the work that would be in progress if there were no labor complications, and the number of persons now thrown idle in the city and its vicinity is estimated at over 50,000, including employees of material men with members of actual building trades.

The striking bricklayers recognize the fact that the contest was immediately due to them, and they have hastened to formulate their demands so as to educate their fellow workmen in what they claim to be their rights and privileges. Their demands are as follows:

1. That their union shall be recognized by the employers, and that no man shall be allowed to work at bricklaying who does not belong to their union.

2. That their employers must recognize the authority of the "walking delegate," who is to be considered the supreme dictator and arbitrator between an employer and his employees.

3. That the working day shall consist of eight hours.

4. That no employer shall have more than two apprentices, no matter how many men he employs.

These are the main points of the bricklayers' demands, which are supplemented by carefully drawn regulations intended to guard them from encroachments that may be undertaken by shrewd employers. The change of pay day from Monday or Tuesday to Saturday is also insisted upon.

The associated builders have met this declaration by the bricklayers with a platform of their principles, which will be recognized as part of the resolutions adopted by the late convention of the National Association of Builders, namely:

1. This association affirms that absolute personal independence of the individual to work or not to work, to employ or not to employ, is a fundamental principle which should never be questioned or assailed; that upon it depends the security of our whole social fabric and business prosperity; and that employers and workmen should be equally interested in its defense and preservation.

2. While upholding this principle as an essential safeguard for all concerned, this association would appeal to employers in the building trades to recognize that there are many opportunities for good in associations of workmen, and while condemning and opposing improper action upon their part, they should aid and assist them in all just and honorable purposes; that while upon fundamental principles it would be useless to confer or arbitrate, still there are many points upon which conferences and arbitration are perfectly right and proper, and upon such points it is a manifest duty to take advantage of the opportunities afforded by associations to confer together to the end that strikes, lockouts and other disturbances may be prevented.

In addition to this general declaration of principles, the employing bricklayers or master masons have formulated a specific declaration to be made a condition of employment, which is submitted to the approval of applicants for work, as follows:

I recognize the right of every man to decide for himself, without dictation or interference, when he shall work or cease to work; where he shall work; how many hours he shall work, and for what wages he shall work.

I recognize the right of the employer to decide for himself whom he shall employ or cease to employ, and to regulate and manage his business with perfect independence, provided only that he deal lawfully, justly, and honorably with all men.

I recognize the right of every father to have his son taught, and of every son to learn any lawful trade to be the same as his right to a knowledge of reading and writing or any other branch of learning, which should be subject to regulation only by the laws of the land.

By accepting employment I agree in all my relations and intercourse with my employers and fellow workmen to maintain and live up to these principles.

Nine hours are to constitute a day's work, except Saturday, when work shall be suspended at 12 o'clock noon. Pay day is to be regularly every two weeks, either Monday or Tuesday. Minimum wages for bricklayers or stone masons are to be 45 cents per hour. On these terms quite a number of builders have started work, securing part of their force from the city and part from other places. Thus far, however, the work begun on this plan is insignificant, and builders generally are of the opinion that the trouble will be continued for several weeks.

Other employers are following the lead of the master masons in endeavoring to secure workmen who are willing to assent to the declaration of principles laid down. The metal manufacturers are especially hearty in their support of the platform. Their trade is seriously affected by the strike, the foundries, especially, not running to more than one fourth of their capacity. The plasterers, however, refuse to fall in line, and some other branches of trade show signs of similar disaffection.

During the early part of last week the Executive Committee of the National Association of Builders sent a delegation to Chicago to investigate the condition of affairs, and to propose a remedy, if possible, as the chances of the disaffection spreading to the building trades of other cities looked very threatening. They surveyed the ground and concluded that the contest was sufficiently important to justify the issue of a long address to the public, but they suggested no practical settlement of the trouble, asserting that it must be fought out by the Chicago people themselves.

Sensational developments are promised by the leaders of the workingmen, who profess to have received legal advice that the combination of the builders to prevent the sale of building material in Chicago is unlawful. It is in the nature of a boycott, and, as a boycott has been held to be an indictable conspiracy under the common law, the labor leaders are of the opinion that the principle laid down applies equally well to this case. It would be curious, indeed, if this scheme of Chicago employers to render their lockout effective would be judicially decided to be as clearly against public policy as the boycott inaugurated by workingmen to help them win their fights.

This great contest has also brought forth another topic of discussion in business circles. The rights of the community have been wholly disregarded by the contestants. The injury to the people of Chicago, and, indeed, to the people of quite distant localities, arising from the present lockout, is very great, perhaps greater than to either of the parties involved, and the necessity seems to exist for the settlement of the controversy by some controlling power. In all probability the Illinois Legislature now in session will be called on to enact a law creating a State Board of Labor, with power to deal with such conflicts as this, and determine what should be done by the parties involved, pronouncing penalties sufficiently great to enforce obedience.

In the meantime the strike or lockout continues, with very little prospect of settlement and with very great interruption to all classes of business depending upon building operations, among which are a number of branches of the iron trade. But, great as is the loss in this respect, what shall be said of the fatuity of those labor leaders who, not satisfied with the pay day they once had, are now compelling their followers to get along as well as they can, and support their families with no pay day at all?

Natural Gas Celebration at Findlay, Ohio.—The celebration of the first anniversary of the discovery and application of natural gas in mechanical arts at Findlay, Ohio, gives promise of being a notable affair. It will be held on June 8, 9 and 10, and a number of prominent persons will be present and make addresses. Invitations have been issued to Hon. B. F. Jones, Jos. D. Weeks and Calvin Wells, of Pittsburgh, besides Governor David B. Hill, of New York, and Governor J. B. Foraker, of Ohio. The following programme has been arranged: Wednesday—Reception of guests; visiting the great gas wells and oil fields; competitive drill of the Patriarchs Militant at Camp Garfield for a purse of $750 for the best company, and $250 for the second best; gas illumination; formal reception of guests; address of welcome at the wigwam, and speeches by distinguished visitors. Thursday—One hundred guns at sunrise; military parade; sham battlefield at Camp Garfield. Friday—Two hundred guns at sunrise; military parade; prize drill at Camp Garfield, open to the world. Prizes—$1000 to the best military company, $500 to the second best, and $250 to the third best company. Laying of the corner stone of the La Grange Rolling Mills by the Masonic body; Ohio Coil and Cable Chain Works, Moore's Chair and Furniture Factory, the Union Boiler Works, the Findlay Door, Sash, Blind and Planing Mill Company, Ohio Lantern Works, will also be laid; driving the silver spike on the Findlay Belt Railroad and laying of the first rail of the Findlay Electric Street Railroad; procession of military and civic bodies, Mayor and Common Council, distinguished visitors, Fire and Police Departments, &c.; all branches of trade and trade industries represented in the procession; fire-works during the procession.

The annual report of the Director of the Mint for the calendar year 1886 estimates the production of precious metals in the United States to have been: Gold, $35,000,000; silver, $51,000,000, the gold showing an increase of $3,200,000 over 1885, and the silver a slight decrease. The large import of silver from Mexico is a serious difficulty in estimating the silver production of the United States, but hereafter a careful account of this import will be kept on the Mexican border. Colorado maintains first place as the largest producer of precious metals, while Montana has surpassed California and become second on the list. The production of Nevada and New Mexico has declined, other States remaining unchanged, and Texas for the first time reporting a silver production. The world's annual supply of silver has doubled since 1882, the price of silver varying widely; during the year it averaged 99 cents per ounce, a ratio of 1 of gold to $20\frac{76}{100}$ of silver. The gold deposits at the mints aggregated $79,057,818, and silver deposits and purchases, $39,086,070. Silver exports exceeded imports by $9,833,891. The director estimates the stock of coin in the United States January 1: Gold, $560,000,000; silver, $324,000,000; in addition to which the mints held bullion: Gold, $81,400,000; silver, $7,000,000. Of the gold coin circulation, $200,000,000 were in the hands of the people and institutions other than National banks east of the Sierra Nevadas. The Director computes the total stock of paper and metallic money in the United States, January 1, to have been $1,879,919,933, or $31.86 per capita, compared to $20.75 per capita in France, $21.53 in Great Britain, and $16.89 in Germany. The consumption of precious metals in the arts is said to have increased during the year.

On the 26th ult. the franchise of St. Mary's Falls Water-Power Company, which has been held by residents of Sault Ste. Marie, Mich., was transferred to a syndicate of capitalists composed of some of the strongest grain men, millers and bankers of Chicago, Milwaukee, La Crosse and points in Iowa, known as the La Crosse syndicate, who have given heavy bonds that the work of improving that immense water-power will be commenced at once and pushed to early completion. This insures the improvement of one of the largest and best water-powers on the continent, having a fall of 18 feet and Lake Superior for a mill-pond. The organization has the right of way for a 150-foot canal through the town, and also owns a large amount of land available for mill and factory sites, docks, &c., which insures satisfactory locations at reasonable prices for manufactories. Several manufacturing companies are negotiating for sites, and two extensive flouring mills and a large paper-pulp mill will be built at once. The water supply is inexhaustible and will not vary from winter to summer from year to year. The capital of the company is $1,000,000, and the cost of the work is estimated at about that amount.

An Administration Tariff Bill.

(From our Washington Correspondent.)

In view of the dissensions in the Democratic ranks over the tariff question and the importance of united action on the subject in the fall of the approaching national campaign, it has been practically decided by the Secretary of the Treasury to prepare either a definite proposition upon the subject of tariff revision in the shape of an outline on the basis of a plan, or to submit a formal schedule of reduction and additions to the free list which will cover the needed revenue reduction. The Secretary's plan is to get at the basis of a compromise among the representative men of the antagonistic positions on the subject, taking Mr. Carlisle as representing the ultra free-trade doctrines and Mr. Randall favoring a protective policy based on the difference between American and foreign labor. He also proposes to give some of the men who are really familiar with the economic as well as the practical features of customs revenue legislation and industries an opportunity to express their views. There is no question from the utterances of members of the Administration that it will be a measure of reduction on some articles and material additions to the free list. In the latter an effort will be made to include iron ore and wool. An attempt may be made on pig iron, but that is not likely to succeed, as there is no one industry more strongly intrenched in the interests of a wider distribution of constituencies. The South is also beginning to feel its direct interest in maintaining, if not increasing, that duty. The steel rail industry is most likely to suffer, as that seems to have become a sort of issue with the free-traders. It is understood that the question will be taken up soon after the close of the fiscal year, so that whatever programme may be determined upon, will be put in shape before the meeting of Congress, which may be in October. In event of an extra session, which now seems almost certain, its object will be revenue discusson and legislation, if possible, so as to leave the regular session free for regular business. The greatest obstacle in the way of the success of an administration tariff revision measure will be the antagonism of the whiskey and the tobacco interests. If a measure can be devised taking something off tobacco, whiskey and customs there might be a prospect of successful reduction on such a compromise, otherwise the chances of a big parliamentary and political battle are certain, and prospects of results dubious.

NAVAL PROFESSIONAL PAPERS.

The Bureau of Navigation will shortly issue a valuable professional paper on "the injurious effect of a blue heat on steel and iron," by C. E. Stromeyer, member of the Institution of Civil Engineers of London. The paper will be a very valuable contribution to metallurgical study, in view of the prominence of that branch of industry under the new conditions of trade influenced by the large demand of the Government for high grade steel.

STEEL FOR CRUISERS.

Commander Robley Evans, chief steel inspector, left for Pittsburgh to day to witness certain inspections of steel for the new cruisers. The most satisfactory results are being reached by the Pacific Rolling Mills, of San Francisco. A report just received from Lieut. F. G. Gilmore shows ultimate tensile strength of finished material for cruiser No. 2 from May 6 to 14 ranging from 60,100 pounds to 65,400 pounds, or an average of 62,750 pounds. The law requires a minimum of 60,000 pounds. The elongation reaches as high as 28 per cent. the law requiring not less than 25 per cent. in 8 inches. The production of high-grade steel has made wonderful progress since the Government entered the market. The results indicate that at an early day American steel will surpass the best product of the works of England and France.

WASHINGTON, May 31.

At length some effort is to be made to explore for natural gas in the vicinity of Chicago. The Cook County Natural Gas, Oil and Water Company have been incorporated for this purpose, with a capital of $30,000. Mr. Frank H. Scott, one of the incorporators, is the attorney of the company, and the parties most actively interested are Henry R. Post and Thomas C. Moore. Mr. Scott said, in a recent interview, that the incorporators had reason to believe that oil might be struck in the immediate vicinity, and that the boring would begin within a short time, under the direction of an expert who had been similarly employed in other States.

The great overflowing artesian well at Belle Plaine, Iowa, which has caused so much trouble and expense to the citizens of that place, has at last been controlled, and the contractor who undertook the work has turned it over to the city. The condition of the well now is that the water flows out through a 5 inch pipe, which can be shut off at pleasure. There is a small leak from a defective joint 20 feet down, but it is comparatively unimportant. This is the first time the great well has been under complete control for nearly a year, when it commenced to spout. Several thousand loads of sand and stone have been emptied into it in efforts to control it. It was a novel feat in engineering, quite a number of experts having been baffled in their efforts to bring the flow of water under subjection.

Albert Alling, general manager and treasurer, of the Barnum & Richardson Mfg. Company, of Chicago, died on the 27th ult. Mr Alling had been connected with the company from its incorporation, and contributed largely to its success. His death was sudden, caused by paralysis of the heart.

Trade Report.

NEW YORK.

American Pig.—The market is quiet and dull, with little inquiry, even considering that it was a broken week. Standard brands of No. 1 Foundry particularly continue very scarce, and in one case at least a large foundry has been idle on account of scarcity of iron. Generally speaking, however, the labor troubles are restricting the quantity being melted, a fact which would be more keenly felt if the current make of No. 1, notably, were not small, as compared with the total output of the furnaces. It is reported by good authority that one of the leading furnace companies of the Lehigh district are making an exceptionally heavy proportion of forge and lower foundry grades. Outside irons, admittedly of fair grade though largely unknown, are offered at $20 @ $20.50 for No. 1 Foundry, while standard brands in moderate lots command $21 @ $22 for No. 1 Foundry, $19.50 @ $20.50 for No. 2 Foundry, and $17.75 @ $18.50 for Gray Forge.

Scotch Pig.—The market is dull and unchanged. We quote for round lots to arrive: Coltness, $21.75 @ $22.25; Glengarnock, $20 @ $20.50; Shotts, $21 @ $21.50; Gartsherrie, $20.50 @ $21; Carnbroe, $20.75 @ $21.25; Clyde, $20 @ $20.50; Summerlee, $21.25 @ $21.50; Dalmellington, $20 @ $20.50, and Eglinton, $19.50 @ $20.

Bessemer Pig.—No business is ereportd in Foreign which remains neglected at $19.75 @ $20 with Domestic at $19.25 @ $20 at furnace.

Spiegeleisen.—There are negotiations pending for some large lots of 20 %, which we quote nominally $27 @ $27.50.

Bar Iron.—The market is very quiet, and we continue to quote Common, 1.85¢ @ 1.90¢; Medium, 1.90¢ @ 2¢, and Refined, 2¢ @ 2.50¢ on dock.

Structural Iron.—There has been no movement of any special significance. We quote: Angles, 2.35¢ @ 2.40¢; Steel Angles, 2.4¢ @ 2.7¢, according to specification; Tees, 2.70¢ @ 2.75¢, and Channels and Beams, 3.30¢, base on dock.

Plates.—We quote for round lots of Common or Tank, 2.30¢ @ 2.50¢; Refined, 2.50¢ @ 2.60¢; Shell, 2.7¢ @ 2.8¢; and Flange, 3.7¢ @ 3.8¢; Extra Flange, 4.25¢ @ 4.50¢. For Steel Plates quotations are as follows: Tank, 2.7¢ @ 3¢; Ship, 3¢; Shell, 3¢ @ 3.25¢; Flange, 3.25¢ @ 3.50¢, and Fire-Box, 4¢ @ 4.50¢, on dock.

Steel Rails.—While the market has been quiet in the East there has been considerable activity in the West. We note a sale of 20,000 tons by an Eastern Pennsylvania mill to the San Antonio and Aransas Pass Railroad, at private terms, 22,000 tons to the St. Louis, Arkansas and Texas Railroad, at a little over $42, at a point near St. Louis, of which 19,000 tons goes to a mill in Western Pennsylvania and the balance to St. Louis. There was sharp competition on this order by importers, on the basis of $40 at New Orleans and with low river freights. In addition thereto there have been three sales of smaller lots, aggregating a little over 10,000 tons, also at St. Louis, and a few blocks for the Northwest, one of them for 5000 tons. It is safe to say that the transactions during the past 10 days foot up over 60,000 tons, with other business still pending. We note also a sale of 3000 tons by Eastern Pennsylvania mills, for delivery at Brunswick, Ga., and 20,000 tons English rails for a Mexican road. We quote, nominally, $38 @ $39, at Eastern mill.

Blooms and Billets.—Foreign material of this class is entirely neglected.

Wire Rods.—The market is irregular, with many rumors of low quotations, but few reports of actual business. The falling off in the demand for Wire will enable buyers of Rods to make their earlier purchases last longer. There are some inquiries. We quote, nominally, $40.

Old Rails.—The only sale reported is a lot of 300 tons of Double Heads in port at $21.50. There is no demand, but on the other hand the bulk of the stock here is held at higher figures by strong parties. One lot of Tees in port is being offered at less than $21, and a lot of Double Heads at $21.50.

Scrap.—The market continues very dull, with Foreign offered at $20 @ $20.50, and Yard Scrap at $22 @ $22.50, with choice lots available at $23.

Rail Fastenings.—We quote Spikes 2.40¢ @ 2.50¢ net; Angle Fish Bars 2.15¢ @ 2.25¢; Steel Angle Bars, $2.25 @ $2.30; Bolts and Nuts 3.10¢ @ 3.20¢, and Bolts and Hexagon Nuts 3.25¢ @ 3.30¢.

Metal Market.

Copper. There has been a fair demand for Lake Ingot Copper for future delivery, with sales of 250,000 ℔ for October delivery at 10.25¢, that price being bid and refused for more. Holders are very reluctant sellers, and if they would come in the market at late prices large lines of future Copper could readily be placed. On the other hand, everything seems to be done to keep down the price of spot Copper, for which there are plenty of buyers at 9.95¢, but very little could be picked up below 10¢. The export of Copper to Europe in all shapes, say, Ore, Matte, Rough and Refined, is increasing steadily, and if continued will place this market in an excellent position for higher prices. The minor brands are very scarce, and are entirely withheld from dealers and speculators, manufacturers confining themselves to supplying only consumers. Chili Bars in the London market were: £39 2/6 on May 26; £39. 5/ on May 27; rising on May 31 to £39. 7/6, and this morning they are down again to £39. 5/. Best Selected remains unaltered at £44. 10/. At the recent annual meeting of the Rio Tinto Company in London, the chairman stated that the directors proposed to raise £500,000 more capital, of which £300,000 would be applied to the paying off of the present floating debt, and the remaining £200,000 to increasing the production of copper from 23,500 to 27,000 tons, or even eventually to 32,000 tons. The dividend declared by the Rio Tinto Company for 1886 has been 3%, against 5½ in 1885, and 8 in 1884; by the Mason & Barry, 2½ against 3¾ and 8, and by the Tharsis Sulphur and Copper Company, 7½ against 10 and 20. The import of American Copper into Liverpool and Swansea, from January 1 to May 16, has been 1,789 tons fine, against 5,364 in 1886; into France, 850, against 962 in 1886; total from all quarters into England and France, 25,571, against 37,391.

Tin.—This has been one of the dullest weeks for a long time, buyers and sellers both being disinclined to operate. Stocks here are in strong hands, more or less concentrated; still our operators are extremely cautious, considering present prices both dangerous to buy and equally dangerous to sell short; hence the stagnation, which may continue for some time to come, unless consumers come to the assistance of the market to drive prices higher. There is, however, very little probability, as they continue to go upon the hand-to-mouth principle. London appears to have got into a rut; quotations advance and recede about 2/6 per ton every other day, and this has happened without any demand from this side for fully six weeks. The shipments from the East during the month of May have been 1200 tons including Great Britain and the United States, a very moderate quantity, which ought to have made things more lively. Our quotations are 23¢ for Spot and June, 22.80¢ @ 22.85¢ for July and August. The market closes in London to-day at £103. 15/ for spot and £104. 7/6 for three months. *Tin Plates.*—The good demand and moderate supply at this distributive center continue the same as before, without change in quotations, which remain as follows, large lines, per box: Siemens-Martin Steel, Charcoal Finish, $4.80 @ $5.20; Coke Finish, $4 65; Ternes, $4.25 @ $4.35, and Coke Tins, $4.32½ @ $4.40, Liverpool also remaining unaltered at 13/.

Lead.—There has been no abatement in the bullish character of our market, 1400 tons Common Domestic selling at 4.65¢, June and July, and 4.67½¢ @ 4.70¢, spot, the closing quotation 4.65¢ @ 4.70¢. It costs 4.70¢ to lay down European Lead in this city. At the West St. Louis has remained steady at the high quotation of 4.40¢, and Chicago at 4.37½¢ @ 4.40¢. In London Soft Spanish has not varied from £12. 2/6, while English Pig has risen 2/6 to £12/10.

Spelter and Zinc.—Nothing of special interest has transpired in Domestic Spelter, which meets with a good inquiry at 4.55¢ @ 4.60¢ for Common Domestic, Silesian remaining the same as before, 4⅞¢, and, in London, £14. 7/6. We quote Bertha Refined 8¢. *Sheet Zinc.*—While the scarcity continues as great as ever, the demand for the time being is only moderate, and the quotation for Domestic remains unaltered at 6.50¢ @ 6.75¢.

Antimony—London has advances in Hallett to £31. 10/, being an improvement of 10/, and here the market is proportionately higher, none being obtainable for less than 7⅞¢ @ 8¢, while Cookson remains steady at 9¢.

New York Metal Exchange.

The following sales are reported:

THURSDAY, May 26.

100,000 ℔ Lake Copper, October	10.25¢

FRIDAY, May 27.

10 tons Tin, June	23. ¢
20 tons Tin, July	22.85¢
10 tons Tin, last half June	23. ¢
50,000 ℔ Copper, October	10.25¢
16 tons Lead, September	4.85¢

TUESDAY, May 31.

16 tons Lead, Spot	4.70¢
32 tons Lead, June	4.67½¢

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, May 31, 1887.

The beginning of the sixth month of the year shows a generally favorable outlook for business. Prices are steadier, and in many instances indicate a tendency toward improvement. Consumers are again entering a great deal of business, some of the larger concerns being fuller of orders than they have been for years. Among these may be mentioned such firms as the Baldwin Locomotive Works, Wm. Sellers & Co., Bement, Miles & Co., E. Harrington, Son & Co., Israel H. Johnson, Jr. & Co. and others. The shipyards are unusually busy, and also manufacturers of Hardware specialties, such as the Enterprise Mfg. Company, Thos. Devlin & Co., A. C. Rex & Co., and all the Saw and File manufacturers, and the Stove trade will probably be working to their full capacity before the end of the week, so that general improvement seems to be pretty well assured.

Pig Iron.—The market begins to show more animation, and although there is no great change as yet, the indications appear to be decidedly favorable to holders. A good deal of low-priced stuff has been picked up lately, and a fair amount of standard grades whenever they could be had at low figures. In this way the market has been pretty well cleaned up, while of such grades as consumers are most likely to need, the supply is by no means large. There are some with a surplus of No. 2 grade, others with Gray Forge and Mottled, and still others with No. 1, but in every instance the accumulations are of the very grades that these furnaces are not supposed to make, and for which, therefore, they have no regular market. Such lots can be had at comparatively low figures, and as they require a good deal of pushing, buyers get the impression that prices are weak, and stocks accumulating, but in trying to get hold of a standard brand, the market does not seem nearly so overloaded or so weak as may have been supposed. It may be premature to predict anything like marked improvement, but the chances are certainly more favorable than they have been for a long time. Consumers are taking in more orders than they have had for many weeks past, and along the entire line there is a disposition to buy. It is true that prices are low and unsatisfactory and buyers are not yet ready for the slightest advance, but they are in the market, which was not the case until recently. It may be that the demand may not do more than check the decline, but there is the strongest reason to believe that it has already done that, and increasing firmness on standard brands is about equally certain. The coming month will probably give a cue to the market for the balance of the year, so that developments will be carefully noted. Prices are, as we have said, very irregular, with sales of some brands at very much lower figures than are ordinarily quoted. Standard makes, however, are firm at $18 @ $18.50, delivered at tide, for Gray Forge, $19.50 for No. 2 Foundry and $21 for No. 1 Foundry. Choice brands bring a little more, and occasionally perhaps a slight shading on standard makes when the order is desirable as to grade required, quantity, delivery, &c.

Foreign Iron.—There is more disposition to take hold of Bessemer Iron, and it is not unlikely that large lots could be closed at something near $20, although firm offers are still hard to get. Sellers ask $20.50 and might shade a trifle to meet the right kind of a bid, as to deliveries, &c. Spiegeleisen is entirely nominal at about $27.50 asked.

Blooms.—No demand of any importance and prices are very irregular and weak. Asking rates about as follows: Rail Blooms, $29 @ $30 asked for shipments; Nail Slabs, $29 @ $30; Sheet-Iron Billets, $34 @ $36; Charcoal Blooms, $54 @ $55; Runout Anthracite, $47 @ $48; Scrap Blooms, $38 @ $39 ℔ "bloom" ton.

Muck Bars.—The market is dull and prices rather inclined to droop, although $32 @ $32.50 at mill is generally asked for good bars. Sales chiefly at the inside figure.

Bar Iron.—There has been a little more inquiry, and one or two large sales, but local mills cannot meet prices made by those in the interior, particularly when large lots are wanted. A sale of 1000 tons Car Iron is said to have been made at less than 1.9¢ delivered, and 1.95¢ @ 2¢ is considered fair average quotations for the general run of business. Some change will have to be made soon or local mills may as well shut down, as it is impossible to meet outside competition on the present basis of cost. Orders for Skelp Iron have also been taken at a full tenth less than Philadelphia quotations, so that only a small local business is being done, and even that is not at remunerative figures. Either prices must advance or cost be reduced, but which it will be remains to be seen, although a little at both ends would do no harm. Nominal rates are 2.2¢ for Best Refined Bars and 2.15¢ for grooved Skelp, but 2¢ and 2.1¢ are nearer to the actual selling prices.

Plate and Tank Iron.—There is more inquiry, and prospects are decidedly better as regards demand, but, strange to say, prices are anything but firm. There are so many mills wanting orders that each one is afraid the other will get them, and in that way prices are kept feverish and irregular. A great deal of business is in sight, and will almost certainly be placed before the middle of the month, but bids are at a full tenth less than has been taken during 1887, and buyers think they will be accepted. Possibly something may be done on that basis for a beginning, but, with anything like general activity, prices cannot go below present quotations, which are nominally about as follows: Ordinary Plate, 2.25¢ @ 2.3¢; Tank, 2.3¢ @ 2.35¢; Shell, 2.5¢ @ 2.6¢; Flange, 3.5¢; Fire-Box 4¢; Steel Plates, Tank, 2.8¢; Shell, 3¢; Flange, 3¼¢; Fire-Box, 3¾¢ @ 4¢.

Structural Iron.—Nothing new can be reported in this department, which, however, is in excellent condition. There is an abundance of work on hand, with a large amount yet to be placed, so that manufacturers feel quite at ease so far as the volume of business is concerned. Prices are steady, and may be quoted same as last week—viz.: 2.4¢ @ 2.5¢ for Bridge Plate; 2.30¢ @ 2.35¢ for Angles; 2.8¢ @ 2.9¢ for Tees, and 3.3¢ for Beams and Channels.

Sheet Iron.—Nothing like general activity yet, although Heavy Sheets are in very fair demand. Light Iron is somewhat neglected as yet, although at low figures orders could easily be had for large lots. Quotations for best makes in small lots about as follows:

Best Refined, Nos. 26, 27 and 28	3¼¢
Best Refined, Nos. 18 to 25	3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	4¼ @ 4¾¢
Best Bloom Sheets, Nos. 22 to 25	4 @ 4¼¢
Best Bloom Sheets, Nos. 16 to 21	3¼ @ 3¾¢
Blue Annealed	2.8 @ 3 ¢
Best Bloom, Galvanized, discount	60 %
Common, discount	65 %

Steel Rails.—There is more inquiry and a firmer feeling, although sales in this vicinity have not been important. Inquiries are in for large lots, but $39 50 @ $40 at mill are firm quotations, and it would have to be something very desirable to secure concessions. Prospects are believed to indicate a decidedly more active market in the near future, and orders are not sought for unless at full quotations.

Old Rails.—There is not much business to report, but the market is steadier, and with light arrivals prices are a shade firmer, say $22 for T's, ex ship, and $23.50 @ $24 for lots in store. Sale to-day 250 tons at $22 ex ship.

Scrap Iron.—There is a little more inquiry, but there are free sellers at quoted rates—viz.: Cargoes of No. 1 Scrap, $20.50 @ $21.50; small lots, tidewater delivery, $22.50; Selected do., $23 @ $24; No. 2 do., $16 @ $17; Turnings, $15 @ $16; Old Car-Wheels, $17.50 @ $18.50; Old Steel Rails, $23 @ $24; Cast Scrap, $16 @ $17; do. Borings, $12 @ $13; Old Fish Plates, $26 @ $27 asked.

Wrought-Iron Pipe.—A fair demand is noted, and prices are quoted firm and steady. Discounts during the past week were as follows: Lap-Welded Black, 50 %; Lap-Welded Galvanized, 32½ %; Butt Welded Black, 32½ %; Butt-Welded Galvanized, 22½ %; Boiler Tubes, 42½ %.

Nails.—Are very quiet, and as a general rule hardly quotable. Manufacturers' agents ask $2.25 for moderate-sized lots, but will sell for less rather than lose a customer, consequently it is difficult to give the correct price. A meeting of the Eastern Association is called for June 9, when a plan will be proposed whereby production will be curtailed so as not to be in excess of consumption.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue,
PITTSBURGH, PA., May 31, 1887.

The Coke strike still continues, but the probability is that it will soon be brought to a close. The Pig Iron furnacemen have asked that the price of Coke be reduced 50¢ ℔ ton, claiming that owing to the recent sharp decline in Pig Iron they cannot afford to pay the present price for Coke. It is evident, therefore, that the Coke operators are not in a position to pay an advance on labor; it is even doubtful whether they will be able to continue the present wage scale. Some of the leaders of the labor organizations have gone out into the Coke regions, and it is thought that an understanding will be arrived at before long. Reference was made in our last report to the bear movement in Bessemer Iron. Reports have appeared in some of the daily papers of sales having been made at prices from $1.50 to $2.50 ℔ ton below what was considered its actual value at the time, by brokers and furnacemen generally. These reports have caused a great deal of trouble in the trade both to brokers and producers.

Pig Iron.—There has been no important change in the position of the market during the past week; the demand continues light, consumers as a rule refusing to buy beyond immediate wants, while prices have undergone no quotable change. Furnaces are still blowing out or banking up for want of Coke, and the output in this district is considerably curtailed thereby. If the strike holds out much longer desirable grades will soon be getting scarce. As will be seen, the near future of the market hinges largely upon the Coke strike. We quote prices as follows:

No. 1 Neutral Gray Forge	$18.75 @ $19.00	4 mos.
No. 2 Neutral Gray Forge	18.00 @ 18.25	4 "
All Ore, Mill Iron	19.50 @ 20.00	4 "
No. 1 Foundry	21.00 @ 21.50	4 "
No. 2 Foundry	20.00 @ 20.50	4 "
No. 1 Charcoal Foundry	24.50 @ 25.50	4 "
Cold Blast Charcoal	28.00 @ 30.00	4 "
Bessemer Iron	21.50 @ 22.00	4 "

In regard to Bessemer Iron, we know of no sales of best quality under $21.25 @ $21.50, cash. The last sale reported was 1000 tons for June delivery at $21.25, cash. Rumors prevail of sales having been made at from $20.50 all the way down to $19, cash, but the best authorities quote at $21.25 @ $21.50, cash, for well-established brands.

Muck Bar—May be quoted at $31.50 @ $32.50 cash, as to quality and delivery. A special lot of 1000 tons, bought for a special purpose, was reported at $32.50. This is an extreme price, and can only be obtained for the very best quality.

Manufactured Iron.—There is a fair degree of activity, and the mills are still pretty fully employed; this will no doubt continue until the 1st of July, as mill owners will want to clear their order books by that time, so that if there is a hitch in the wage-scale and a shut-down ordered, they will be in readiness for the same. Prices for first quality Iron are still quoted upon a basis of 2¢ for Bars, 60 days, 2 % off for cash.

Nails.—There is no improvement to report; great dullness prevails, and the prospect for an early improvement is not as encouraging as it might be. There is a possibility that the last part of the season may be much better than the first. It is evident that stocks in the hands of jobbers are light, and they may be forced to buy before long. Manufacturers nearly all expected a good trade this spring, but they have been badly disappointed; it is to be hoped that there will be an improvement during the summer. Prices are still quoted at $2.15, 60 days, 2 % for cash, though it is intimated that sales have been made as low as $2.

Wrought-Iron Pipe.—There is more inquiry, and it begins to look as if the mills would soon have about all they could do. Some large orders are on the market, which it is expected will be placed within the next week or two. While we continue to quote former prices, they are not in all cases being strictly adhered to. On desirable orders prices are being cut to some extent, but in a regular way the rates quoted are pretty generally obtained. Discounts on Black Butt-Welded Pipe, 35 and 5 %; Galvanized do., 25 and 5 %; Black Lap-Welded, 52½ and 5 %; Galvanized do., 35 and 5 %; Casing, all sizes, 45 %; Boiler Tubes, 42½; 2-inch Tubing, 16¢ ℔ foot, net; 2-inch Line Pipe, 14¢; 8-inch Drive Pipe, $1.40.

Old Rails—Continue dull; consumers, as has been the case for some time past, are buying only as their immediate necessities require. Foreign Tees may be quoted nominally at $24.50 @ $25, and double heads at 50¢ additional.

Steel Rails—Are quotable at $39 @ $40 cash at mill, with a sale of 20,000 tons reported at the inside quotation. Mills here are in a very good condition, being sold several months ahead.

Billets, &c.—All kinds of Bessemer Steel is still reported dull and prices weak. We are advised of a sale of Billets (American) at $32, cash, which has been the ruling price for a couple of weeks or more. Nail Slabs continue very dull and may be quoted, nominally, at $31.50 @ $32.

Railway Track Supplies.—Prices are weaker, in sympathy with the raw article, but remain unchanged. Spikes, 2¼¢, 30 days, delivered; Splice Bars, 2.10¢ @ 2.20¢; Track Bolts, 3.30¢ with Square, and 3.40¢ with Hexagon Nuts.

Old Material.—There is no improvement in demand and prices are weak and nominal. No. 1 Wrought, $22 @ $23 net ton; Wrought Turnings, $17 @ $18; Cast Axles, $29 @ $30; Cast Scrap, $17.50 @ $18, gross; Rail Ends, $22 @ $22.50; Open Hearth, $20 @ $21, gross; Crucible do., $25 @ $26, net ton.

Chicago.

Office of *The Iron Age*, 36 and 38 Clark St.,
Cor. Lake St., CHICAGO, May 30, 1887.

Labor troubles still interfere with the regular course of business in this locality. The coke strike made itself felt last week in the banking up of several of the local furnaces, and the fear of still greater evil effects caused a number of prominent Iron and Steel manufacturers to go to Pittsburgh to endeavor to hasten the termination of the disagreement between the operators and their workmen.

Pig Iron.—Furnace agents report a very good demand for Charcoal Pig, and some sales of round lots. Plenty of inquiries are also in the market for future delivery. There is less Charcoal Iron in sight than has been the case for four of five years at this season, and speculative lots are being taken up at full prices, with the exception of a few small lots of off-grade Irons, which are subject to the usual concessions. A feature of this branch of the trade is the disposition of buyers to pay a little advance for future deliveries, in some cases amounting to as much as 75¢ ℔ ton. The furnace companies, however, are slow to approve contracts for future delivery, except for quite small lots to be taken monthly. The market for Coke Iron has been seriously affected by the Coke strike, which has cut off the supply of such Irons quite considerably. In a number of cases parties have been unable to get the brand they wished, and have been compelled to look in other directions. This has had the effect of steadying the price for this kind of Iron, which was about to slump at the time the strike began. It is the opinion of some of the best informed members of the trade that this strike assures firmness to the Coke Iron market for several months, if not for the whole of this year. The situation is slightly complicated, however, by the position of Southern furnaces that are selling off-grade Irons here in considerable quantities, quite sufficient, in fact, to affect the market for competing grades, but not for the higher grades of Foundry. Prices of Bessemer Pig do not seem to have been affected by the low prices reported from Pittsburgh, but sellers are looking pretty sharply for orders. Quotations are as follows for cash, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, $23 @ $23.50; Southern Cold Blast Charcoal, $27; Blackband Coke Softeners, $23.50 @ $24; No. 2, $22 @ $23; Hanging Rock and Jackson County Softeners, $22; Straight Coke Foundry, No. 1, $22.50 @ $23; No. 2 $22.50; No. 3, $20 @ $20.50; Coke Bessemer, run of furnace, $22.50; Southern Coke, No. 2, $21 @ $22; No. 2½, $20 @ $21.

Bar Iron.—Although plenty of inquiries have been in the market during the past week, and a number of sales are reported, yet prices are a shade weaker than before. This is due to the determination of a number of mills to secure orders, although other

Trade Report.

mills are very firm in their views and refuse to take orders for any delivery whatever, being filled up to the 1st of July, and hesitating to name a price after that time for fear of labor complications. The price for Common Bar as usually quoted here is now about 1.80¢ at mill, which is equivalent to 1.95¢ @ 2¢ on cars at Chicago. In some cases this price has been shaded, especially for desirable specifications. Refined or All Muck Bar Iron is held at about 2.2¢ on cars here. Store quotations still range from 2.20¢ to 2.30¢, according to the size of the order.

Structural Iron.—Nothing new is reported under this head, except that the mills rolling shapes are so full of orders that it is found exceedingly difficult to get prompt deliveries. The contract for the iron work of the Chicago Auditorium has been awarded to the Snead & Company Iron Works, of Louisville, Ky., as stated more fully elsewhere.

Plates.—A considerable quantity of Tank Plate has been sold during the week, the demand being particularly good for bridge work. Prices now range from 2.45¢ to 2.50¢, on cars, at Chicago. Quite a number of large orders for Iron and Steel Plates are now in sight, with vigorous competition for them between local and outside parties. Stove trade is dull, with no change in prices.

Sheet Iron.—In consequence of the reported formation of a pool among the Sheet Iron manufacturers, prices have been advanced by manufacturers' agents and are now quoted on a basis of 3¢ for No. 27 Common Black at mill, which is equal to about 3.15¢ @ 3.20¢ on cars at Chicago. The advance in price has been made too recently to judge what its effect will be on the demand. During the early part of the week, however, sales were slow. Store prices are still quoted on a basis of 3.40¢ for No. 27. The demand for Galvanized Iron is fair and prices are still quoted by jobbers at 50 % and 15 % discount for Juniata and 60 % for Charcoal.

Merchant Steel.—Inquiries made among large consumers show that a heavy demand may be expected in July and August, some of them requiring considerably more than they took last year. At present a steady jobbing trade is in progress, and prices are without change.

Steel Rails.—Orders aggregating several thousand tons have been placed during the week for summer delivery, and local manufacturers now report that all gaps have been filled for June, July and August. No disposition is manifested to cut prices in order to get trade for fall or winter, but $43 and upward continues to be the asking rate.

Old Rails and Wheels.—The Old-Rail market has been very sluggish during the week, and no transactions are reported. Nominal quotations are $23 @ $23.50. Offers of Car-Wheels have been made at $21, but buyers only bid $20.

Scrap.—Stock is accumulating rapidly in dealers' hands, and they are now in excellent shape to fill orders if business were active, but for some time there has been very little demand for this class of material, except for Cast Scrap. The building strike, however, is affecting even this, as the demand among the Architectural Iron Works is exceedingly light. Quotations for carefully selected Scrap are as follows, ₩ ton of 2000 lb: Railroad Scrap or No. 1 Forge, $20.50 @ $21.50; Railroad Track, $18 @ $19; Mill or No. 1 Wrought, $16; Light or No. 2 Wrought, $10; Boiler Plates, $15; Pipes and Flues, $14; Stove Pipe, $11; Machinery Cast, $14 @ $15; Cast Borings, $11.50; Machine Turnings, $12; Axle Turnings, $14; Coil Steel, $16; Leaf Steel, $17; Locomotive Tires, $20; Horseshoes, $20; Axles, $23; Mixed Country Wrought, $13 @ $14.

Nails.—The situation is very unsatisfactory from the manufacturers' standpoint. They have succeeded in disposing of a considerable quantity of Steel Nails during the week, in lots ranging from 1000 to 5000 kegs, but prices have been very low, from $2 to $2.10 delivered. Iron Nails have been sold at $1.95 @ $2. Steel Nails are now crowding Iron Nails very hard and there seems to be a disposition to run the latter out. If this is the policy of the large manufacturers no early advance in Nails can be expected, as Steel Nails must be kept low in price for some time to accomplish this result. Jobbers report a good consumptive demand. There are few carload sales, but nearly every order coming in has Nails on it. They quote $2.15 for Iron and $2.25 @ $2.30 for Steel, but these prices are shaded when necessary. Wire Nails are still moving freely. Manufacturers' agents ask $3.10 @ $3.20, while jobbers quote $3.30 @ $3.40 base.

Barb Wire.—The demand on the jobbers has been very good during the past week, and although orders are small, seldom going above 3 tons, stocks are running low in consequence of the continuous drain. Manufacturers are found to be unable to make prompt deliveries, in consequence of the orders they have booked, and the jobbers are talking of holding a meeting shortly to advance prices. They now quote 3.50¢ for Painted and 4.25¢ for Galvanized, in either small or large lots. Manufacturers are holding at 3.30¢ for Painted and 4.05¢ for Galvanized in large lots.

Hardware.—Trade continues excellent for the season. The demand for Shelf Hardware is reported good, while Heavy Hardware is moving very freely. Tin Plate is quite scarce, especially Roofing. The price of Roofing has advanced about 75¢ a box. Bright is considerably firmer, but there is no change in quotations.

The Chicago office of Brown, Bonnell & Co., of Youngstown, Ohio, has been removed to the Phœnix Building, corner of Clark and Jackson streets, in which Mr. Chas. H. Hawkins, agent, has secured handsome and commodious quarters.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts.,
CHATTANOOGA, TENN., May 30, 1887.

Pig Iron.—The great number of inquiries that have been received by Southern furnaces during the past week are encouraging, and lead to the belief that contracts will soon be made for all the better grades of iron for the remainder of the year. As a matter of fact many contracts have already been made. Prices are very firm, and some claim that they have advanced at least 25¢ ₩ ton. A few of the furnaces have considerable lots of off grades in their yards, which occasionally find a market at conceded figures, but it would be quite a difficult task to effect new contracts for prime grades for round lots at any concession below what the figures have been ruling for the past few weeks. The consumption of iron by the Southern foundries has been steadily increasing, not only by the increased work of the old foundries, but also by quite a number of new ones getting under way who are applying themselves to specialties. The South Pittsburgh Pipe Works made their first run last week, and will very soon enter the field of trade with a full assortment of cast Water and Gas-Pipe. The question of Coke is still a very serious one with Pig Iron producers, and, although there are now being erected something like 250 new ovens by mining companies that are now running, yet the output of these will be but a fraction of what would meet with a ready sale to the new furnaces that are being erected.

Cleveland.

CLEVELAND, May 30, 1887.

Iron Ore.—The sale of a 14,000-ton lot of No. 1 Specular and Magnetic Bessemer Ore at $6.90 is reported. The strike of Ore handlers on the docks has not influenced the market. There have been several sales of round lots during the past 10 days, and furnacemen are inclined to believe that they have obtained concessions in one or two instances. The best brands of Specular and Magnetic Ores are no longer quoted above $7 ₩ ton, although the output of one or two large mines has hitherto sold for $7 @ $7.50. Daily cargoes of Ore are being received from all the important Lake Superior ports. About 40,000 tons came down during the past week. Not far from 20,000 tons went forward to the furnaces. Furnacemen claim that they have already purchased three-fourths of all the Ore they will use this season. They seem in no hurry about the remaining fraction, and look for better figures from the mine owners before the season closes. A furnaceman to whom we applied for information concerning the market returns our communication indorsed: "Mine owners well sold up. Furnacemen well supplied. The latter will wait for slightly modified quotations before completing their orders. We already note slight concessions in the best grades." A few inquiries for Bessemer Hematites are reported, and a few small sales at prices embraced in the quotations given below have occurred. A much larger amount of Ore is being received at Fairport Harbor, 30 miles east of Cleveland, than ever before. Ashtabula is receiving fully as much as last year and Cleveland very much more. The three ports combined will receive from 400,000 to 800,000 more tons of Ore than last year. The strike on the docks has extended from the men employed in loading the Ore into cars to those engaged in reloading vessels. The trouble is becoming somewhat serious, and several vessels may be obliged to seek other ports in order to be relieved of their cargoes. Rates for lake transportation are slightly firmer. Vessels from Escanaba have received $1.40 ₩ ton during the week, and there is talk of an increase in the rate from Ashland. Following are quotations in this market:

No. 1 Specular and Magnetic Ores, Bessemer quality	$6.50	@	7.00
No. 1 Specular and Magnetic Ores, Non-Bessemer quality	6.00	@	6.50
Red-Hematite Ores, Bessemer quality	5.75	@	6.00
Red-Hematite Ores, Non-Bessemer quality	5.00	@	5.50
Menominee Range Ores, Bessemer quality	5.50	@	6.25
Menominee Range Ores, Non-Bessemer quality	4.75	@	5.25
Gogebic Range Ores, Bessemer quality	5.50	@	6.00
Ores for Mill Use	6.00	@	7.00

Pig Iron.—The market is certainly improved. There has been an active movement among buyers during the week, and a number of substantial transactions have occurred. Freight rates can at last be fairly well determined, and several sales that were hanging fire on this account have taken places. The fact that the Coke strike is still on encourages sellers to hope for better prices. It is known that several large buyers who have been barely existing for three or four weeks have been forced into the market, and are compelled to ask for Iron. Soft Silvery Irons are down 50¢ ₩ ton. Otherwise quotations are unchanged from last week:

Nos. 1 to 6 Lake Superior charcoal	$24.00	@	24.50
No. 1 Strong Foundry, Bessemer quality, ₩ ton	21.85	@	22.35
No. 1 strong Foundry, ₩ ton	21.35	@	21.85
No. 2 strong Foundry, ₩ ton	20.85	@	21.35
No. 1 American Scotch, ₩ ton	21.50	@	22.00
No. 2 American Scotch, ₩ ton	20.50	@	21.50
No. 1 Soft Silvery, ₩ ton	20.00	@	21.00
Mahoning and Shenango Valley neutral Mill Irons, ₩ ton	..	@	19.50
Mahoning and Shenango Valley Red Short Mills, ₩ ton	..	@	20.00

Scrap.—Old Rails are quoted at $24.50, but sales have taken place at lower figures. Old Wheels have sold for $21.50.

Nails.—Steel Nails are down from $2.30 to $2.20; Iron Nails from $2.20 to $2.10; Steel Spikes from $2.55 to $2.45, and Iron Spikes from $2.45 to $2.35.

Manufactured Iron.—The market has shown some signs of life during the week, although Bar Iron is still quoted at $2.10.

Cincinnati.

CINCINNATI, May 30, 1887.

Pig Iron.—There has been increased pressure to sell Silvery Iron and "off" grades, resulting in much lower prices, and even the better grades, while not offered to any great extent, have been carried down with the tide; at the decline buyers have taken hold and some large sales are reported, with others pending. Many furnaces are still behind on old contracts, but this fact apparently does not interfere with them booking new orders for new business, and on the present basis of prices, too, which is notable. There are others, however, who will not listen to anything of the kind, still being strong in the opinion of a speedy advance. The sales of Bright and Silvery Irons which have been made during the week aggregate between 6000 and 7000 tons, sold by one firm, while others have made little less in amount. These sales have been made on a basis of $19.50, cash, for No. 2 Southern Coke Foundry, here, for delivery between now and fall, but the sales of standard full grades made have been in 50 and 100-ton lots. Southern Car Wheel has been in active demand, one lot of 500 tons, selling on basis $25, cash here. Lake Superior Iron has been very heavy, with quotations as low as $23.75 cash at Cincinnati. There have been moderate sales of Mill Iron, at $17.50 @ $17.75 for No. 2 cash, here, but some are quoted down to $17. Labor troubles have appeared here as a disturbing element, yet in some respects it is favorable to buyers, as cutting off consumption of Pig Iron. The "stove men" and Hall's Safe and Lock "hands" are out. The current cash price for Pig Iron, f.o.b. cars at Cincinnati, are as follows:

Charcoal Foundry.			
Hanging Rock, No. 1	$23.00	@	$24.00
Hanging Rock, No. 2	21.00	@	22.50
Southern No. 1	21.00	@	22.00
Southern No. 2	20.00	@	21.00
Coal and Coke Foundry.			
Ohio Soft Stonecoal, No. 1	20.00	@	20.50
Ohio Soft Stonecoal, No. 2	19.00	@	19.50
Southern Coke, No. 1	20.00	@	20.50
Southern Coke, No. 2	19.00	@	19.50
Southern Coke, No. 3	18.00	@	19.00
Ohio and West Pennsylvania Coke, No. 1	21.00	@	22.00
Ohio and West Pennsylvania Coke, No. 2	20.00	@	21.00
Forge.			
Strong Neutral Coke	18.00	@	18.50
Mottled	17.00	@	17.50
Southern Coke	17.50	@	18.50
Car-Wheel and Malleable Irons.			
Southern Car-Wheel	25.00	@	27.00
Hanging Rock, Cold Blast	26.00	@	27.00
Hanging Rock, Warm Blast	24.00	@	25.00
Lake Superior Malleable	24.00	@	25.00

Manufactured Iron.—There has been a fair degree of activity, and barring the "stove" and "safe" labor trouble, affairs are unchanged. We quote: Bar Iron, 2¢ @ 2.10¢; Charcoal Bar Iron, 3¢ @ 10¢; Sheet Iron, Boiled, Nos. 10 to 27, 2¼¢ @ 3¼¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3¼¢ @ 4¼¢ ₩ lb.

Nails.—The market has developed a weaker tone, and prices have further declined with a moderate demand, Iron, 10d. to 60d., selling at 2.10¢ ₩ keg, and Steel at 2.20¢ ₩ keg, and other sizes at proportionate rates.

Messrs. Rogers, Brown & Co., of Cincinnati, have taken a portion of the new United Bank Building, at the corner of Walnut and Third streets, having outgrown their present quarters.

Louisville.

LOUISVILLE, KY., May 31, 1887.

Pig Iron.—The market is again quiet, and sales during the last week have not been so large as the week previous; the general conditions remain about the same—most of the furnaces being still behind on deliveries, many of hem having had to stop more or less for want of coke. In some cases foundries have had to buy outside lots of Iron in the hands of speculators to keep them running, in consequence of the non delivery of their purchases of Iron from furnaces. Most of the furnace yards, therefore, are bare of regular grades. Some of them have small and moderate sized lots of irregular grades that they do not sell for future delivery, but sell only as they make same. There are still, however, enough outside lots in the hands of speculators and in the hands of founders who bought more Iron than they have used, to supply the demands of manufacturers. The tendency of the market is downward rather than upward. Many of the surest and far-seeing buyers, however, look for an improvement from the 1st to the 10th of July, and some are making inquiries for Iron for delivery during the last six months of the year. Any little reaction in prices now would create an active demand and large purchases, and would send the market up. We quote, for cash, as below:

Southern Coke, No. 1 Foundry	$20.50	@	$21.00
" No. 2 "	19.00	@	20.00
" No. 2½ "	18.50	@	19.00
Hanging Rock Coke, No. 1 Foundry	19.00	@	20.00
Southern Charcoal, No. 1 Foundry	21.00	@	22.00
Silver Gray, different grades	17.50	@	18.50
Southern Coke, No. 1 Mill, Neutral	17.50	@	18.00
" " No. 2 " "	17.00	@	17.50
" " No. 1 " Cold Short	17.50	@	18.00
" Charcoal, No. 1 Mill	18.50	@	19.50
White and Mottled, different grades	16.00	@	17.00
Southern Car-Wheel, standard brands	25.00	@	26.00
Southern Car-Wheel, other brands	23.00	@	24.00
Hanging Rock, Cold Blast	25.00	@	26.00
Hanging Rock, Warm Blast	22.00	@	23.00

W. B. BELKNAP & CO., Louisville, report as follows, under date of May 30, 1887: The volume of business is most encouraging. We doubt if there ever was a better May, taking the line of Iron and Hardware through, than the one just closing. The amount of business would really make a buoyant market were it not for the depression and distrust incident to the decline in Nails and certain other articles affected thereby. Both Wool and Tobacco, among the large staple products of our State, have experienced exceptional activity, and advances which go to make both the producer and the dealer reasonably happy. Money is active with banks, owing to the demand in the country, and the rates of interest from 6 % to 7 % firmly demanded. On the whole, the commercial outlook is extremely bright, and unless the Treasury locks up too much money for the country's good, we shall see a continued prosperity.

Bar Iron—Is firm and selling freely. More or less concessions are offered on fancy sizes, but this does not affect the general list.

Hoops and Bands—Have declined $1 or $2 ₩ ton. There is no special call for this class of iron.

Sheet—Is firm, and with little prospect of a much lower price. Inquiries are coming in quite freely for summer delivery, but until the labor scale is settled mills are not committing themselves to any great extent.

Nails—Are being bought freely, but still there is no speculation in them, at least buying does not seem to be of a speculative nature. Wire Nails continue to grow in favor, and are one of the standard articles of the trade now even in the South, which was the last section to take hold of them.

Wire.—The demand for Wire has fallen off somewhat as the season of agricultural activity progresses, but it will unquestionably recover later on.

Detroit.

CHARLES HIMROD & CO., dealers in Pig Iron, Detroit, Mich., report, under date of May 30, 1887, as follows: The recent dull market has been stimulated a little by some pretty good-sized purchases, particularly that of Lake Superior Charcoal Iron. Demand in the East for this grade of metal shows that users are short and seem very anxious to get the Iron in as quickly as possible, and it looks as if the period for general buying is now at hand, and large business may be expected. The Coke strike has had the effect of delaying the making of considerable Iron in Ohio, and of sending some orders South which otherwise would not have gone there. Although there is no definite understanding yet reported between the employees and the Coke operators, it is hoped that the strike will be of short duration. Quotations of last week may be repeated, which are as follows:

Lake Superior Charcoal, all numbers	$23.00	@	$24.00
Lake Superior Coke, All Ore	23.00	@	24.00
Lake Superior Coke, Cinder Mixed	21.00	@	22.00
Standard Ohio Blackbands	23.00	@	24.00
Southern No. 2	20.75	@	21.50
Southern Silvery	21.00	@	22.00
Jackson County, Ohio Silvery	20.50	@	22.50
American Old Iron Rails	23.50	@	25.00
Old Wheels	20.00	@	21.00

Coal Market.

The Anthracite Coal companies report a fair trade in progress; prices fair but unchanged. The output for June is likely to be about 2,500,000 tons, corresponding with the tonnage of June one year ago, but in giving information representatives of the trade avoid any expression which would indicate the existence on their part in any form of agreement or combination. In some way they contrive to act in harmony, within the pale of the law, and expect to convince consumers that they are able to regulate their business in the absence of an actual pool. Trade, except in response to the demands of manufacturers, is comparatively quiet, and is expected to remain so until September. Meanwhile, a material change in prices is spoken of as improbable. The interval will be employed by several of the corporations in building new breakers and otherwise improving their facilities. To day the new system of uniform tolls from all coal breakers goes into effect, the buyers paying the through rates from the mines to destination; but coal going to New York markets is not effected. Prices are quoted as heretofore: Free Burning White Ash, Broken, $3.55 @ $3.85; Egg, $3.80 @ $3.95; Stove, $4.15; Chestnut, $3.85 @ $4; Pea, $2.75 @ $3; Pittston is a shade lower excepting Chestnut, $4.05 and Pea, $2.95. The Western Anthracite Committee agreed to an advance of 10¢ ₩ ton on Broken.

The total amount of Anthracite sent to market for the week was 645,579 tons, compared with 647,318 tons in the corresponding week last year. The total amount mined is 12,805,044 tons, compared with 11,807,078 tons for the same period last year, an increase of nearly 1,000,000 tons. Of the total the Pennsylvania Railroad transported 4,000,000 tons. The Bituminous Coal trade is unchanged, at $3.15 f.o.b., or $3.70 alongside in New York.

Accounts from the Connellsville Coke region encourage the belief that a settlement of difficulties is not far off. An embarrassment is the reduction in prices urged by a committee representing the blast furnaces.

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	₩ lb.	....	@	.80	.07
Light Copper	₩ lb.	....	@		.06
Copper Bottoms	₩ lb.	....	@		.06
Brass, Heavy	₩ lb.	....	@		.07
Brass, Light	₩ lb.	....	@		.01
Composition	₩ lb.	....	@		.08¼
Lead, Heavy	₩ lb.	.80.03¾	@		.04
Tea Lead	₩ lb.	....	@		.03½
Zinc	₩ lb.	.03	@		.03¼
Wrought Iron	₩ ton.	22.00	@		24.00
Light Iron	₩ ton	12.00	@		13.00
Stove Plate Iron	₩ ton.	12.00	@		10.00
Machinery Iron	₩ ton.	15.00	@		16.00
Grate Bars	₩ ton	....	@		7.00
Old Rubber	₩ lb.	.05	@		0.51/16
White No. 1	₩ lb.	.03¾	@		.04¼
White No. 2	₩ lb.	.01¾	@		.02¼
Canvas, Linen, No. 1	₩ lb.	.04¼	@		.04½
Canvas, Cotton, No. 1	₩ lb.	.03¾	@		.04½
Canvas, No. 2	₩ lb.	.02¾	@		.02½
Seconds	₩ lb.	.01	@		.01½
Soft Woolens	₩ lb.	.07	@		.07½
Mixed Rags	₩ lb.	.01	@		.01¼
Gunny Bagging, No. 1	₩ lb.	.01 9-16	@	.01 11-16	
Jute Butts	₩ lb.	.01 9-16	@		.01⅝
Book Stock	₩ lb.	.00¾	@		.01⅜
Newspapers	₩ lb.	.00¾	@		.01
Waste Paper	₩ lb.	.00¼	@		.00½
Kentucky Bagging	₩ lb.	.02¼	@		.02½
Kentucky Bale Rope	₩ lb.	.03½	@		.04
Kentucky Bagging	₩ lb.	.02¼	@		.0258

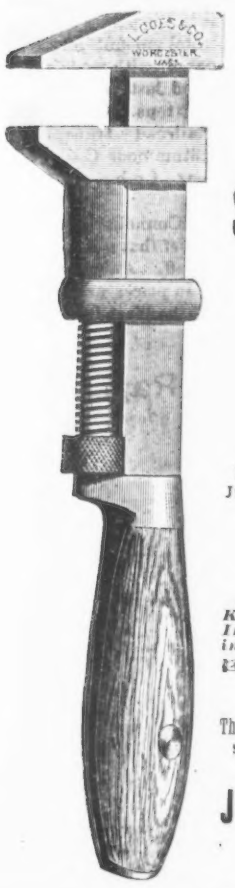
Apparatus for Steaming Locomotives.

In a recent issue of the *Railroad Gazette* we find an illustrated description of what is known as Greenwade's apparatus for steaming locomotives, now successfully used on the Cincinnati, New Orleans and Texas Pacific Railroad.

The apparatus is designed to enable the water in the boiler of a cold engine to be heated from any engine in steam in the round-house. The saving of fuel is considerable, as it often happens that there is an engine just in, requiring to be blown off. A valve and piping enables a connection to be made so as to enable steam to pass from one engine to the other. It is a matter of two or three minutes' work to connect the two engines, and either heat the cold water by blowing back into the boiler, or get up a good fire, by using it as a blower. It is, however, more frequently used both ways at the same time. An overhead pipe runs clear round the round-house, with a down pipe between every second stall. Two steam proof rubber hose connections are kept in readiness to make attachments. All the engines have a species of triple valve, by which the connection can be made with another engine.

In an emergency steam has been raised from cold water on a 17 x 24 inch passenger engine in about 20 minutes. In case of shops taking fire this device would be invaluable, as sufficient pressure to move the engines out could be transmitted from one engine to another. A very similar device has been used for many years on the Great Eastern Railway (England), and was there found to be of great practical value and convenience. A plain taper plug valve was used placed on top of the boiler barrel near the smoke box. The valve could be worked by a rod from the cab. The valve being channeled in a peculiar manner in one position, the valve was closed; in the second position, a communication was opened between the steam space in the boiler and the blower pipe in the base of the chimney, and in the third position communication was established between the steam space and a branch, to which a pipe could be coupled to a neighboring engine. The valve on the engine in which steam was to be got up could be placed in a fourth position in which steam could pass from the branch to the blower. Mr. Greenwade's arrangement is somewhat different in detail, but answers the same purpose.

Jones & Laughlins, Oliver Brothers & Phillips, Oliver & Roberts, William Clark & Co., Singer, Nimick & Co., Park Brothers & Co., J. Painter & Sons, Carnegie Brothers & Co., and Lindsey & McCutcheon are formulating the terms of an appeal to the Interstate Commerce Commission from the classification of certain specialties put in effect by the Trunk Line Committee in New York on May 25. This classification was in the nature of a reduction of fifth-class articles: angle, bar, boiler, bridge beams, channels, cast-iron pipe, wrought-iron pipe, tubing, skelp, tank, nails (kegs), nuts, bolts, puddle bars, spikes, railroad frogs, chairs splices, switches, switch stands, rivets and horse and mule shoes. In this same class, hoop, band and sheet iron, fencing and plain wires, axles and springs, links and pins, have always been reckoned. However, in making up the list, the last named articles were not included in the reduction, and hence are carried at higher rates, and, it is claimed, at a rate that cannot be maintained either in justice or equity, or in ratio to other similar freights. So great is the difference in rates that Pittsburgh manufacturers claim it is in the nature of a gross discrimination, and properly comes under the provision of the law relative to this offense. Iron men lay the failure to keep up the list in its proper shape to the fact that none of those who formulated it are familiar with the manufactures and specialties of this city. The circular of the Trunk Line Committee referred to in the above is No. 827, and took effect on the 25th ult.; it is to cover the period up to November 1st. It provides a rate on the basis of 25 cents from New York to Chicago during Lake navigation, on carload lots to points west of trunk line terminus.



L. COES'

GENUINE IMPROVED

Knife Handle

PATENT

Screw Wrenches

MANUFACTURED BY

L. COES & CO.,

Worcester Mass.

ESTABLISHED IN 1839.

Patented July 6, 1880. Patent July 8, 1884.

Registered March 31, 1874.

Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.

☞ *Straight Bar, Extra LONG NUT FOR SCREW IN JAW*

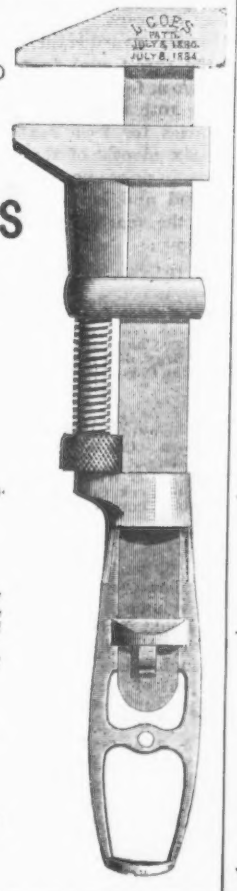
The Best Made and Strongest Wrench in the Marke

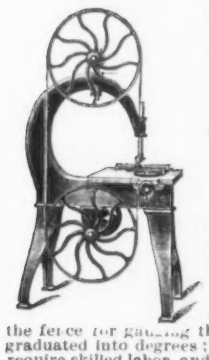
Send for Illustrated Price List and Circular.

J. C. McCARTY & CO.,

NEW YORK,

Sole Agents.





Patent Flexible Back Band Saws,

For Cutting Iron, Steel, Brass, Plate, Piping, &c.,

ONE OF THE GREATEST LABOR SAVING MACHINES EVER USED.

Metal cut quicker and at less cost than by the use of the Lathe or Planer.

The teeth of our Flexible Back Band Saws are hardened so that a file will not touch them, consequently they will cut any metal that can be cut with the best Hack Saw ever known. They never break when properly Brazed as the back is soft. They are discarded when worn out because their exceeding cheapness warrants it.

The Band Saw Machine specially constructed for our Patent Flexible Back Band Saws, has Iron table 24 inch square in which a slide is made level with the top surface, operated by a screw and hand wheel, which carries the fence for gauging the angle of the cut. Any angle can be used that is desired. The fence is graduated into degrees; four different speeds adaptable for class of metal to be cut; does not require skilled labor, and when known is destined to be one of the most popular machines in use in machine shops, Brass, Metal and Iron Foundries, and by all workers of metals. *Send for Circular.*

Frames, 20, 22 and 24 in. $1.50
Blades, 20, 22 and 24 in. . . $3.00 per dozen.

No. 3 8 inch Patent Hack Saw Frame, price $0.25
These Hack Saw Frames are made of Spring Steel Japanned and are the cheapest and best ever put on the market for the money.

We furnish Patent Extension Hack Saw Frames. Malleable Cast Steel, Japanned and of fine finish. (See Cut.)
No. 1. Extension frame, can be adjusted to hold 6, 7 and 8 inch blades, price $1.00
No. 2. Extension frame, can be adjusted to hold 9, 10, 11 and 12 inch blades, price $1.25

These saw frames are made of Spring Steel backs. The only Kitchen saw in the market with attachment for adjusting tension of blade.
Price, 12 in. . . $7.00 per dozen.
" 14 in. . . 7.50 " "
" 16 in. . . 8.00 " "

We have greatly improved the quality of our patent Flexible Back Hack Saws, and they have been tested by mechanical experts. One and all pronounce them the best Hack Saws ever put on the market.

Length of blade	6 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.
Price per Doz.,	55c.	60c.	65c.	70c.	85c.	95c.	$1.05.

WHEN SENT BY MAIL EXTRA CHARGE FOR POSTAGE.

Sample blades cheerfully mailed on application. Send for Circular.

Liberal discount to the trade. Correspondence solicited. Address

HENRY G. THOMPSON & SONS,

Cor. Elm and State Streets, New Haven, Conn.

Branch Office, 51 Leonard St., N. Y. City.

Southington Cutlery Co.,

SOUTHINGTON, CONN.

Only Manufacturers of the

GENUINE HORSE SHOE CURRY COMBS.

Also Manufacturers of Steel and Iron Squares, Wood Screws, Razors and Pocket Cutlery. Send for Prices.

Send for Catalogue showing other styles.

"Ladies' Pet", just after opening Tin Can.

THE

"LADIES' PET CAN OPENER"

Is a long-felt want at last attained.

"Ladies' Pet" is adjustable to any size can, strong, beautifully polished, has a hard wooden handle, best of steel knife, simple in construction, easy to work, and without exception the best tool on the market for **15 Cents.**

Trade supplied at liberal discount by

HISCOX FILE MANUFACTURING CO.,

MANUFACTURERS' AGENTS,

West Chelmsford, Mass.

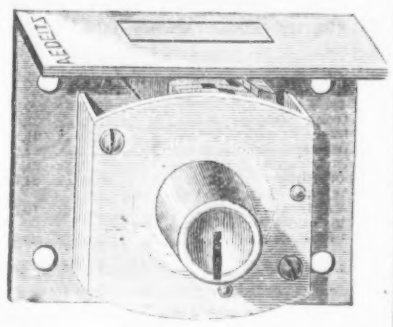
BRASS GOODS MFG. CO.,

Manufacturers of Stamped Brass, Silvered and Tin Goods, Hyatt's Patent Brass and Iron Spring Bolts,

Bronze and Plated Thimbles, Roses, Plate Escutcheons, Socket Shells, &c., Mucilage Brushes, Patent Mirror Pin Cushion Business Cards, Mirrors for Perfume Bottles, Hyatt's Patent Sensible Safety Pins. Novelties of New Designs made to order.

Salesroom, 88 Chambers St., New York. Factory, 250 to 254 State St., B'klyn.

A. E. DEITZ.



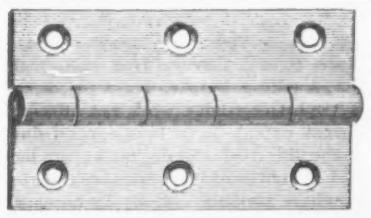
No. 51 Lock.

J. C. McCARTY & CO., Agents,

97 Chambers and 81 Reade Sts.,

NEW YORK.

Factory, BROOKLYN, E. D., N. Y.



W. & J. TIEBOUT,

MANUFACTURERS OF

BRASS, GALVANIZED & SHIP CHANDLERY

HARDWARE.

Nos. 16 & 18 Chambers Street,

NEW YORK.

ALWAYS GIVES THE UTMOST SATISFACTION.

Main Belting Co.,

Manufacturers of

THE LEVIATHAN

COTTON BELTING.

Unsurpassed for Strength, Durability and Cheapness.

Made to any Length, Width and Strength.

Main Driving Belts.

Guaranteed to Run Straight, Even Throughout.

No Cross Joints, **Unaffected by Damp.** Clings well to the Pulley. Has no equal. In fact, is THE BELT.

MAIN BELTING COMPANY,

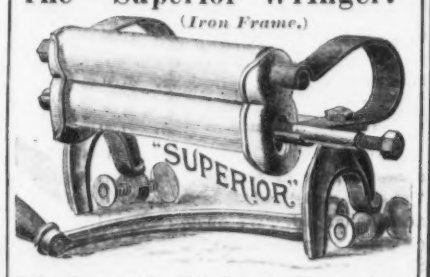
S. W. cor. Ninth and Reed Sts., Philadelphia.

Also

248 East Randolph St., CHICAGO.

The "Superior Wringer."

(Iron Frame.)



Fully Warranted. Has Patent Adhesive Rolls, Best Steel Springs, Malleable Iron Crank.

☞ Send for fully illustrated Catalogue and Price List of thirty different styles and sizes of Wringers.

BAILEY WRINGING MACHINE CO.

WOONSOCKET, R. I.

PORTAGE IRON CO. (Lim.),

—MANUFACTURERS OF—

IRON AND STEEL

Bars, Rods, Shafting, Hoops, Bands, Angles, &c. Made Exclusively from Pig Iron.

Duncansville, Pa.

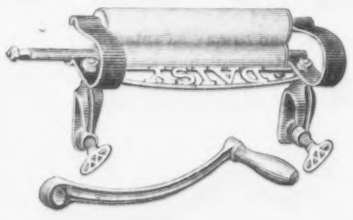
Freight Rates same as Pittsburgh

A. R. WHITNEY & CO.

SELLING AGENTS,

17 Broadway, P.O. Box 33, New York City.

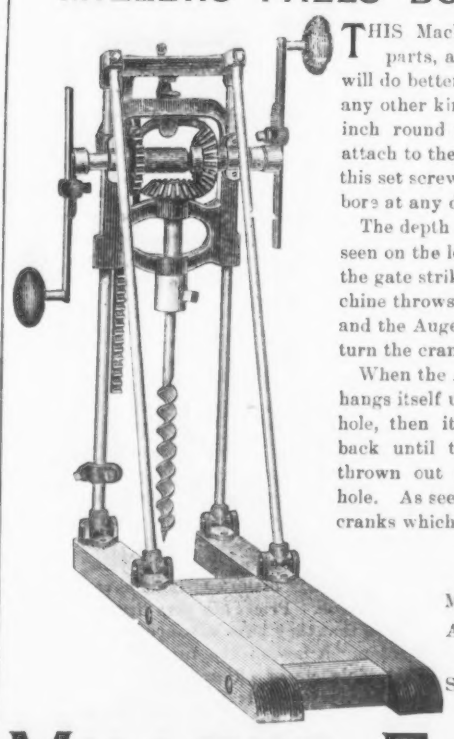
The "Daisy" Wringer.



Tub Wringers, Bench Wringers, Clothes Drying Bars, &c.

EMPIRE WRINGER CO., AUBURN, N. Y.

MILLERS FALLS BORING MACHINE.



THIS Machine has been fully perfected in all its parts, and is now sold with full warrant that it will do better work and give better satisfaction than any other kind in use. The frame is made of half inch round steel rods; the braces are the same and attach to the rods at the top by a set screw. When this set screw is loosened, the frame falls over so as to bore at any desired angle.

The depth of hole to be bored is fixed by a stop, as seen on the left hand upright rod in the cut. When the gate strikes this stop a latch is lifted and the machine throws itself into gear by the use of a spring, and the Auger is lifted out of the hole by continuing to turn the crank in the same direction.

When the Auger is drawn from the hole the frame hangs itself up until the machine is moved to the next hole, then it is dropped down by turning the crank back until the Auger strikes the wood, when it is thrown out of gear and proceeds to bore the next hole. As seen in the cut, the machine has adjustable cranks which fully regulate its speed and power.

PRICES:

Machine, without Augers, - . $7.50
Augers in sets, 18, 23, 41 quarters. $3.00. $3.75. $6.75.
Sizes of Augers (1, 1½, 2) (1, 1¼, 1½, 2) (½, ⅝, ¾, ⅞, 1, 1¼, 1½, 1¾, 2)

MILLERS FALLS CO.,

74 Chambers Street, New York.

CHAMPLAIN

Forged Horse Nails.

MANUFACTURED BY THE

NATIONAL HORSE NAIL CO.,

Vergennes, Vermont.

HOT FORGED AND COLD HAMMERED POINTED MADE OF BEST NORWAY IRON AND WARRANTED.

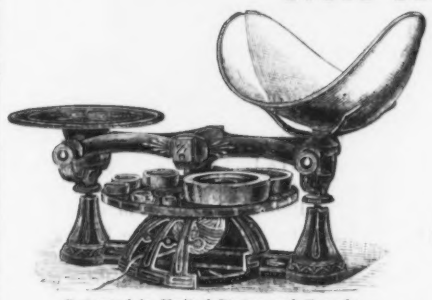
WAREHOUSE

97 CHAMBERS AND 81 READE STREETS NEW YORK.

J. C. McCARTY & CO. Sole Agents.

IXL COUNTER SCALE,

STEEL BEARING.



Holds the Weights and Twine.

Weight Holder Revolves.

Full Line of Brass and Tin Seamless Scale Scoops.

Patented in United States and Canada.

SOUTHWARK SCALE COMPANY,

51 North 2d Street, - PHILADELPHIA, Pa.

P. LORILLARD RONALDS, Jr., Pres. CHARLES R. FOWLER, Vice-Pres. HENRY S. LANPHER, Sec'y & Treas.

American Tin Zinc Company,

LIMITED,

Factory, SEYMOUR, CONN. **85 Beaver St., New York,** Telephone Call, "PEARL 233."

MANUFACTURERS OF

TIN ZINC,

W. J. WILDER'S PATENT, March 10th, 1885.

A New Metal especially adapted for Roofing, Lining Refrigerators, the Manufacture of Britannia Ware and all Articles where Spun Metals are Required. An excellent Substitute for Tin Copper and White Metals.

THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

ALSO, LANE'S PORTABLE COFFEE ROASTER.

Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers,

LANE BROS., Poughkeepsie, N. Y.

Also Sold by Leading Wholesale Houses.

Our agents, John H. Graham & Co., 113 Chambers St., New York carry a full line of our goods, and will be pleased to serve you at factory prices.

WALPOLE MILLS

EMERY

SOUTH WALPOLE, MASS-CHUSETTS.

Exports.

The following table presents the exports of Hardware, Iron, Steel, Metals, &c., from the port of New York, for the week ending May 31, 1887:

	Quan.	Val.
Argentine Republic		
Ag imp. pkgs	487	$11,446
Pumps. pkgs.	15	1,355
Mf. iron.pkgs.	116	1,582
W. barrows..	303	663
Cartridges, cs	29	534
Hdw., cs......	503	9,728
Clocks, cs.....	73	1 673
Cutlery, cse..	1	303
Revolvers, cs.	4	1,882
Granite ware, cs	32	1,903
Sew. machs..	4	75
Mach'y. pkgs.	812	14,846
Tacks, cs.....	50	348
Avallon (France).		
Ag.imp. pkgs.	27	850
Amsterdam.		
Hdw., cs.	10	215
Pumps, pkgs.	9	520
Ag. imp.,pkgs	3	71
Asia.		
Hdw., cs......	10	295
Antwerp.		
Sew. ma., cs..	75	852
Rifles. cs.....	3	350
Hdw., cs......	2	20
Budapest.		
Ag.imp., pkgs	60	2,000
Bremen.		
Stoves, cs. ..	42	100
Ag. imp.,pkgs	16	415
Pumps, pkge.	1	25
Hdw., cs......	30	1,434
British Guiana.		
Cutlery, cs...	2	50
Ag.imp., pkgs	1	23
Clocks, cs.....	6	178
Mf. iron, pkgs	6	81
Hdw., cs......	45	588
Firearms, cs..	1	168
Tinware, cs..	1	18
Nails, kegs...	10	41
Berlin.		
Hdw., case...	1	108
Belfast.		
Sew. ma., cs..	33	805
Brazil.		
Irons, cs.....	30	175
Mf. iron, pkgs	275	3 012
Cartridges,cs.	19	361
Hdw., cs.....	277	3,936
Sh't iron, pge.	1	25
Mach'y, pkgs.	89	7,065
Sew. ma., cs .	90	1,680
Pumps, pkgs.	2	52
Nails, bxs....	12	50
Ag.imp., pkgs	48	740
Agate-ware,cs	36	1,545
Firearms, cs..	11	2,101
Cutlery, cs...	95	2,247
Nails, kegs....	185	430
Tinware, cs..	4	110
Car-wheels,pr	8	400
Locomotives.	[illegible]	10,350
Clocks, pgs...	257	3,487
Cotton gin, cs.	5	300
Tacks, cs.....	63	569
Brass gds., cs.	4	55
Tinware, cse..	1	10
British Possessions in Africa.		
Cartridges, case........	1	31
Ag. imp.,pkgs	136	2,463
Mach'y, pkgs.	6	28
Hdw., cs......	22	283
British East Indies.		
Cartridges, cs	5	100
Hdw., cs. ...	4	102
Clocks, pkgs..	56	1,064
Bordeaux.		
Ag. imp.,pkgs	11	250
Sew. ma., cs..	60	641
Pumps, pkgs.	12	600
Mach'y, p-gs.	4	500
Copper, cks ..	90	12,000
Windmill, cs..	18	1,5 0
British West Indies.		
Mf. iron, pkgs	80	500
Hdw., pkgs,..	60	5 3
Sew. ma., cs..	20	565
Mach'y, pkgs.	8	149
Clocks, cs.....	7	86
Windlass	1	25
Ag.imp., pkgs	6	39
Nails, kegs...	144	436
Nails, cs	47	232
G. m sheathing, cs......	4	191
Cutlery, cs...	3	35
Tinware, cs..	10	186
Barcelona.		
Hdw., cs......	3	75
British Australia.		
Ag.imp., pkgs	21	350
Clocks, bxs...	52	1,304
British Honduras.		
Nails, kegs....	35	80
Cutlery,cs....	2	71
Sew. ma.,cs..	6	158
Hdw., cs......	20	266
Nails, kegs...	5	29
Ag. imp.,pkgs	2	12
Liverpool.		
Windmill.....	1	975
Hdw.,cs......	55	989
Mach'y, pkgs.	16	1,857
Arms, cases..	8	773
Ag imp., pkgs	22	450
Clocks, cs....	2	519
Copper matte, sk...	2889	23,000
Copper, cks..	9	1,000
Copper, pigs.	1448	20,349
Pumps, pkge.	1	25
Sew. ma., cse	1	10
Tin cans, cse.	1	40
Copper, bars.	170	5,714
Copper, cs...	219	3,906
Brass sp'klers, cs	31	2,125
London.		
Ox. zinc, bbls	150	1,194
Ag. imp..pkgs	25	1,000
Mach'y, pkgs.	4	907
Sw. ma., cs. .	129	6,263
Clocks, cs. ...	216	4,523
Hdw.,cs......	77	3,674
Guns, cs......	9	845
Brass g'ds, pgs	7	306
Wringers, cs..	2	43
Leith.		
Ag.imp., pkge	1	40
Munich.		
Printing pr'ss, pkgs........	3	500
Marseilles.		
Ag.imp., pkgs	30	823
New Zealand.		
Ag. imp.,pkgs	31	500
Naples.		
Hdw., cs.....	15	671
Granite ware, case...	1	45
Sew. ma., cs..	19	260
Nova Scotia.		
Tins, bag.....	1	11
Mexico.		
Mach'y, pkgs.	83	2,271
Revolvers,cse	1	80
Mf. iron, pkgs	23	689
Ag. imp.,pkgs	22	419
Sabres, cs....	5	750
Clocks, cs....	47	953
Sew. ma., cs.	217	3,855
Water wheels	2	148
Shot, kegs. ..	5	96
Nails, kegs...	18	43
Cartridges,cs.	48	1,848
Tacks, cs ...	6	65
Cutlery, cs...	84	1,196
Hdw., cs.....	107	1,324
Firearms. cs.	7	1,147
Per. caps. cs.	5	225
Tinware, cs...	5	141
Nails, cs......	7	36
Orenburg.		
Ag. imp.,pkgs	8	150
Peru.		
Sew. ma., cs..	4	108
Mach'y. pkge	1	325
Cutlery, case.	1	45
Philippine Islands.		
Brass g'ds,cs.	2	58
Mach'y, pkgs.	6	291
Porto Rico.		
Brass g'ds,cs.	4	282
Metal goods, case........	1	34
Hdw., cs......	11	125
Mf. iron, pkgs	119	576
Plumb. matls, pkgs........	4	34
Nails, kegs ...	26	59
Palermo.		
Sew. ma., cs..	100	1,148
Rome.		
Hdw., cs.....	90	5,441
Rotterdam.		
Ag. imp.,pkgs	2	91
Mach'y, pkgs	7	1,500
Carbines, cs..	60	8,050
Hdw., cs... ..	2	50
Siam.		
Ag.imp., pkgs	3	29
Hdw., case...	1	79
Mach'y, pkgs.	2	41
St. Petersburg.		
Ag. imp.,pkgs	40	750
Santo Domingo.		
Rifles, cs.....	3	358
Cartridges, cs	10	200
Cutlery, cs ..	7	157
Hdw, cs.......	5	90
Nails, keg.....	1	17
Mf.iron, pkgs.	7	128
Brass g'ds,cse	1	67
Copper goods, case	1	4
Iron, pkgs....	234	292
Uruguay.		
Revolvers, cse	1	1,038
Br. goods, cs..	4	435
Mf. iron, pkge	1	80
Ag. imp.,pkgs	70	1,554
Pumps, pkgs.	2	114
Sew. ma., cse.	1	22
Clocks, cs ..	81	1,767
Cutlery, cse..	1	75
Hdw., cs......	15	635
U. S. of Colombia.		
Mf. iron, pkgs	398	3,450
Steel, pkgs...	69	65
Tin, bxs......	6	31
Firearms, cse	1	17
Tinware, cs..	2	40
Hdw., pkgs...	60	1,285
Cutlery, pkgs	37	388
Sew. ma., cs..	40	722
Mach'y, pkgs.	70	5,706
Brass g'ds,cs.	5	192
Babbitt metal, cs...........	5	137
Nails, kegs...	30	65
Cartridges,cse	1	15
Ag.imp., pkgs	3	44
Pumps	5	58
Vienna.		
Pumps, pkgs.	9	307
Sew. ma., cse.	1	35
Venezuela		
Hdw., pkgs...	260	2,293
Clocks, cs	14	400
Mf. iron pkgs	508	2,716
Nails, kegs...	22	57
Ag.imp.,pkgs.	3	40
Sew. ma. oil, cs	3	18
Tacks,cs......	29	206
Sew. machines	99	2,082
Mach'y, pkgs.	622	16,568
Nails, cs.....	7	99
Tinware, cs..	18	594
Cutlery, cs...	24	370
China.		
Clocks, bxs...	258	4,434
Ger.silver, cs.	24	2,643
Cutlery, cs....	1	6
Hdw., cs......	6	253
Wire cloth, cs	1	15
Rifles, cs......	3	380
Sew. ma., cs..	15	249
Christiania.		
Hdw.,cs.....	108	860
Mach'y, pkge.	1	80
Ag.imp., pkgs	111	3,010
Wringers, cs.	8	240
Clocks, cs.. ..	13	170
Copenhagen.		
Mach'y, pkgs.	2	225
Tinware, case	1	27
Clocks, cs....	41	599
Mf. iron, pge.	1	80
Ag.imp., pkgs	16	565
Hdw., cs......	14	453
Chili.		
Granite ware, cs..........	2	167
Ag imp., pkgs	1	25
Hdw., cs......	3	431
Central America.		
Cutlery, cs...	19	429
Nails, kegs....	34	85
Mchy, pkgs...	14	626
Nails, case....	1	33
Tinware cs...	2	8
Hdw., cs......	77	1,479
Mf. iron, pkgs	237	1,216
Sew. ma., cs.	72	1,328
Cartridges,cs.	3	72
Clocks, pkgs.	20	621
Shot, bags....	3	16
Rifles.........	2	84
Tin, bxs	20	112
Brass goods, cse..........	1	235
Pumps	1	50
Cuba.		
Mach'y, pkgs.	35	2,171
Ag.imp., pkgs	29	1,429
Pumps, pkgs.	2	58
Clocks, cs....	3	50
Cutlery, cs....	6	210
Tinware, case	4	106
Sew. ma., cs..	3	49
Nails, cs......	6	78
Mf. iron, pkgs	458	2,580
Hdw., pkgs...	122	1,547
Nails, kegs...	162	730
Wire cloth, cs	2	78
Tinfoil, cs.....	5	162
Steel, pgs. ..	24	101
Dutch West Indies		
Tinware, cs...	2	5
Yel. met'l, cs..	2	119
Nails, kgs....	23	68
Hdw., cs......	14	84
Mf. iron.pkgs.	2	14
Sew ma., case	1	7
Danish West Indies.		
Nails, kgs....	54	136
Ag.imp., pkge	1	16
Tinware, cs..	3	45
Hdw., cs	23	477
Clocks, case..	1	12
Mf. iron, pgs.	6	30
Nails, bxs.....	8	25
French West Indies.		
Hdw., cs......	4	122
Sew. ma.. cs..	4	83
Glasgow.		
Clocks, cs....	57	376
Sew. ma., cs..	359	4,201
Mach'y, pkge.	1	528
Ag. imp.,pkgs	49	530
Ghent.		
Mach'y, pkge.	1	150
Genoa.		
Ag.imp., pkgs	2	57
Hamburg.		
Mach'y. pkgs.	18	1,404
Hdw., cs.....	49	1,256
Wringers, cs..	30	918
Wire cloth,cse	1	75
Sew. ma. cs..	863	17,771
Ag.imp., pkgs	460	9,676
Clocks, cs ..	27	489
Firearms, cs.	2	200
Pumps, pkgs	2	52
Havre.		
Hdw., case....	1	25
Wire. reels...	16	500
Copper, casks	225	17,358
Sew. mach.,cs	20	1,800
Copper, bars.	291	13,000
Hull.		
Cott. gin fixts cs	5	430
Hdw., cs	2	65
Wringers, cs..	2	32
Ag.imp., pkgs	19	1,560
Clocks, cs	3	71
Japan.		
Sew. ma., cse	1	20
Hdw., cs.....	31	179
Clocks, pkgs..	482	8,585
Mf. iron, pkgs.	38	338
Nails, case ...	1	15

Exports of Metals from May 23 to 28.

	Pounds.
Copper:	
J. A. Abbott & Co.	112,500
Bridgeport Copper Company	238,180
Ladenberg, Thalmann & Co	347,309
Copper Matte:	
T. F. Kennedy	696,696
Williams & Terhune	714,751

Imports.

The following were the Imports of Hardware into the Port of New York for the week ending June 1, 1887:

Baur, C. M. Vom, Case, 1
Boker, Carl F. Mdse, cs., 2
Brown Bros. Cases, 12
Boker, Hermann & Co. Mdse., cs., 9; Chains, cks., 25
Booth & Co. Mach'y, pkgs., 9
Burkinshow, W. C. Cases, 2; Cks., 2
Crane & Beard Mfg. Co. Case, 1
Curley J. & Bro. Cutlery, case, 1
Domeyer, Fred. Case, 1
Dreyfus, Wieller & Co. Cases, 3
Dunscombe & Frith, Pots, 144
Everitt, P. Mach'y, cs., 3
Erie Disp. Co. Mach'y, cs., 19; Mach'y, pcs., 6
Folsom H. & D. Arms, cs., 3
Field, Alfred & Co. Mdse., cs., 10; Cases, 2
Hartley & Graham, Arms, cs., 12
Hammacher, Schlemmer & Co. Nails, cs., 38
Howell, Son & Co. Machines, pkgs., 20
Havemeyer & Elder, Mach'y, cs., 20; Mach'y, parts, 9
Henderson Bros. Stoves, pkgs., 49
Kastor, A. Cutlery, cs., 3; Mdse, cs., 3
[illegible] Gas Engine Co. Mach'y, cs., 11
McCoy & Sanders, Mdse., cs., 5
McNaughton, Stoves, cs., 7
Moseman & Bro. Case, 1
Pollock, T. C. Cask, 1
Robinson Bros. & Co. Cutlery, case, 1
Rumsey & Co. Mach'y, box, 1
Rose, L. P. Mach'y, cs., 10; Cases, 6
Schotte, Wm. & Co. Mdse., cs., 6
Sumner, C. P. & Co. Chain cable, lengths, 3; Anchor, 1
Taylor, Thos. Cases, 5
Whitman Saddle Co. Case, 1
Western Arms Co. Guns, case, 1
Wiebusch & Hilger, Mdse., 15; Chains, cks., 26; Packages, 6
Witte, John G. & Bro. Needles, case, 1
Order. Mach'y, cs., 21

The importations of Cutlery, Hardware and Metals at this port during the week ending May 27, were as follows:

	Quantity.	Value.
Anvils	167	$884
Brass goods	102	2,340
Bismuth	4	2,018
Clocks	20	1,059
Copper	....	147
Cutlery	85	22,363
Dutch metal	13	2,059
Guns	81	8,864
Hardware	29	2,905
Machinery	99	7,528
Metal goods	263	21,449
Nails	21	2,116
Nickel	33	8,118
Old metal	....	1,878
Platina	1	9,851
Plumbago	2,359	27,431
Quicksilver	100	3,221
Reg. Antimony	41	1,883
Spelter, lb	233,076	8,118
Tin, bxs	37,069	145,191
Tin, slabs 2,019; lb	147,422	33,042
Zinc, oxide	157	1,543

Imports for the Week Ending May 28.

IRON AND STEEL.

	Tons.
Iron Ore:	
Naylor & Co	3,409
As. Earnshaw	376
Pig Iron:	
Dana & Co	750
Crocker & Co	100
Jas. Lee & Co	100
Henderson Bros	755
Naylor & Co	840
G. W. Stetson & Co	200
W. H. Walbaum & Co	1,800
E. S. Wheeler & Co	275
Spiegeleisen:	
Dana & Co	125
Crocker Brothers	777
Naylor & Co	1,444
C. L. Pierson & Co.	10
Old Iron Rails:	
Dana & Co.	500
T. J. Pope & Co.	353
G. W. Stetson & Co	800
Rail Ends:	
Dana & Co	7
Old Steel:	
T. J. Pope & Co	114
Scrap Iron:	
J. A. Abbott & Co	173
Leaf Spring Steel:	
Page, Newell & Co	500
Old Fish Plates:	
Neumark & Gross	125
Steel Wire Rods:	
J. A. Abbott & Co	30
Carey & Moen	13
A. Heyn	200
Naylor & Co	1,280
Page, Newell & Co	101
Steel Brass:	
Naylor & Co	50
E. S. Wheeler & Co	154
Steel:	
M. Strouse & Co	20
Union Bridge Company	748
W. F. Wagner	13
R. H. Wolff & Co.	68
Steel Forgings:	
Thos. Prosser & Son	100
Steel Tubes:	
Thos. Prosser & Son	21
W. H. Wallace & Co	3
Steel Billets.	
E. S. Wheeler & Co	308
Steel Tires:	
Thos. Prosser & Co	45
Iron Beams:	
R. F Downing & Co	31
Rivet and Nail Rods:	
J. A. Abbott & Co	714
Fuller, Dana & Co	25
A. Heyn	25
N. Lilienberg	20
G. Lundberg	30
Mueller, Schall & Co	28
Naylor & Co	70
Iron:	
J. A. Abbott & Co	48
G. Lundberg	134
Iron Bars:	
Naylor & Co	60
Charcoal Iron:	
Page, Newell & Co	95
Steel Plates:	
R. F. Downing & Co	50
Union Bridge Co	153
Steel Sheets:	
R. F. Downing & Co	24
Sheet Iron:	
A. A. Thomsen & Co	15
F. B. Coddington & Co	9
Hoops:	
J. S. Leng & Co	75
TIN PLATES.	Boxes.
Bruce & Cook	1,454
J. Byrne & Son	1,000
Central Stamping Company	1,574
T. B. Coddington & Co	6,114
N. L. Cort & Co.	2,958
R. Crooks & Co	5,241
H. R. De Meet & Co	855
Dickerson, Van Duzen & Co	13,69.
Holder & Co	587
Lalance & Grosjean Mfg. Company	130
C. S. Mersick & Co	326
Naylor & Co	6,759
Phelps, Dodge & Co	20,725
Pratt Mfg. Company	5,470
A. A. Thomsen & Co	6,517
E. A. Wheeler & Co	4,449
H. Whitemore	100
Wolff & Roesing	1669

METALS.

Spelter:	Tons.
Jas. Askell & Co.	22
R. J. Godwin	84
Ladenburg, Thalmann & Co	276
Mueller, Schall & Co	35
Naylor & Co	501
W. H. Osgood	29
Sheet Zinc:	
R. Crooks & Co	83
Tin:	
Bidwell & Trench	84
J. Davol & Son	15
Lehmaier, Son & Co	11
Naylor & Co	137
Phelps, Dodge & Co	247
D. Thomsen & Co	13
Nickel:	Pounds.
McCoy & Sanders	7,000
Antimony:	Casks.
E. Hill & Co	200

Imports of Iron, Steel and Metals Into New York.

	To May 21. Gross tons.	Last week. Gross tons.
Iron Ore	8,662	3,408
Pig Iron	41,306	4,074
Spiegeleisen	35,435	3,451
Old Rails	76,858	2,051
Scrap Iron	10,878	298
Scrap Steel	9,173	620
Blooms and Billets	30,030	1,056
Steel rails	126	....
Wire Rods	40,634	2,205
Iron Bars	3,756	277
Steel Bars	5,303	223
Beams	757	30
Steel Plates	2,745	248
Pig Tin	4,258	202
Tin Plates, boxes	658,406	82,482

MANUFACTURING.

Iron and Steel.

The Chicago Steel Works have closed their doors, extinguished their fires, and are busily engaged in taking down and removing all their old rolling machinery, for the purpose of introducing their new improved train of three high rolls, and their splendid 300 horse power automatic cut-off durable engine and Heine safety boiler, for which a new chimney, 114 feet high, has been built.—*Industrial World.*

To an inquiry addressed to the Pottsville Iron and Steel Company, of Pottsville, Pa., regarding a strike which was reported to have taken place at their works by which 700 men were thrown idle, we received the following reply: "Our men did stop work on Tuesday morning the 24th ult., and commenced again the following Thursday. The only reason we know of their stopping work was that 'Barnum's circus was in town.'"

Mr. John Fulton, general mining engineer of the Cambria Mining Company, has been appointed general superintendent of all the works of the company, except the Gautier Department.

Douglass Furnaces, of Pierce, Kelley & Co., at Sharpsville, Pa., were banked on the 23d ult. on account of the coke strike. Every blast furnace in the above place is now idle.

Mary Furnace, of the Ohio Iron and Steel Company, at Lowellsville, Ohio, was banked on the 24th ult. on account of the coke strike.

All the blast furnaces of the Pennsylvania Steel Company, at Steelton, Pa., are now in blast with the exception of No. 2, which will resume operations in a short time.

The Standard Iron Company, Limited, of Norristown, Pa., closed down their works last week for an indefinite period. The following notice, signed by J. Wood, Jr., & Co., was posted on the works: "On account of the indisposition of certain employees to properly perform their services, work in this mill will be suspended for the present. All hands will be paid on Saturday, May 28, and the superintendent will, when the mill again starts, notify all whom he desires to return."

The Maumee Rolling Mill Company, of Toledo, Ohio, who have an output of 50 tons of iron per day, give the following comparative estimates of the cost of coal and gas for fuel: The cost of coal was $200 a day, to which had to be added the wages of men who handled the coal, hauled away the cinders, &c., and the cost of grate bars and fire-bricks. The total cost of coal fuel was figured up at $5.25 per ton of iron produced, while the cost with gas is but $1.90—a saving of $3 35 per ton, or $167 50 a day. The difference in favor of natural gas is $50,000 a year, or 10 per cent. of the amount of the capital invested.

Edward A. Smith, of Smith Bros. & Co., proprietors of the La Belle Steel Works, Allegheny City, Pa., retired from that firm on the 14th ult. All business of the firm will be settled by Andrew D. Smith, David H. Smith, Hugh D. Smith and Frank B. Smith, who have associated themselves together as a partnership as Smith Bros. & Co., to carry on the business of the manufacturing of steel.

Carnegie Bros. & Co., of Pittsburgh, have just rolled and are about to ship from the Union Mill, at Thirty-third street, a contract of 600 tons of bridge iron for Galveston, Texas, and 1300 tons of structural iron for the State building at Denver, Col.

The new pipe mill of the Reading Iron Works, at Reading, Pa., has been completed, and commenced operations last week.

A new spike factory began operations at South Bay City, Mich., on the 16th ult., with two machines capable of turning out 60 to 80 kegs of spikes per day.

The Nut and Washer Mfg. Company have been incorporated at Milwaukee, with a capital of $10,000, by Ichabod B. S. Isted, Wm. D. Halstead and Albert J. Read.

The Pittsburgh *Chronicle Telegraph* states that Park Bros. & Co.'s Black Diamond Steel Works now have over 80 puddling and heating furnaces and 13 trains of rolls. Two of the latter are used for rolling copper. There are also 35 steam hammers and 33 shearing machines and six open hearth steel furnaces. In the crucible line they have two 42 pot, two 24-pot, one 30-pot, and three 48 pot Siemen's steel melting furnaces, and yet they are unable to meet the demand for crucible steel. But in order to try and do so they have just leased the crucible-steel department for two years in the Fort Pitt Iron Works, at Thirty-second street, late of Graff, Bennett & Co.

The Snead & Co. Iron Works, of Louisville, Ky., have been awarded the contract for all the iron-work of the Chicago Auditorium, amounting to 3600 tons of wrought and cast iron. The work is to be commenced immediately, and the building is to be under roof by February next, subject of course to the contingencies of the labor trouble in the building trades. The price is between $250,000 and $300,000. This is the largest contract for building iron-work ever let in Chicago. Messrs Carnegie Bros. & Co., limited, of Pittsburgh, will furnish the beams required, but all the other work will be done by the Snead & Co. Iron Works, whose shops are equipped with the necessary facilities. These enterprising manufacturers maintain an office in the Home Insurance Building, Chicago, under the management of C. W. Trowbridge.

Machinery.

The Wainwright Mfg. Company, of Boston, report the following sales of feed water heaters during the month of May: Six in New York City, two in Montreal, and one each in Truro, N. S.; Buffalo and Troy, N. Y.; Athol, Chelsea, Greenfield and Waltham, Mass.; Manchester, N. H.; Greenwich and Willimantic, Conn., and a large size heater in Yokohama, Japan.

The employees of the Hall Safe and Lock Company, of Cincinnati, have gone out on a strike. A year ago they were granted nine hours a day. In November the company returned to 10 hours without increased pay. Now the men demand nine hours and increased pay.

The Chicago City Railway Company began last week to operate their new cable road from Thirty-ninth to Sixty-third streets on State street. Steam for the engines is furnished by three large Hazleton boilers. These boilers are upright, inclosed in brick towers, answering the purpose of boilers, furnaces and chimneys. They are not the first of the kind in Chicago, however, as the Bouton Foundry Company have had one in use for some months.

The Crane Bros. Mfg. Company, of Chicago, have purchased the business of the N. O. Nelson Manufacturing Company, at Kansas City, Mo. This purchase, in connection with their recent acquisition of the business of the English Bros. Machinery and Supply Company, will make their Kansas City equipment full and complete in all its departments. They will carry stocks of wrought-iron pipe, cast and malleable fittings, plumbing goods, pumps, engines, boilers, and the most complete line of machinery supplies to be found in the West. The business will be under the management of Mr C. C. English. Mr. M. C. W. Belden will remain in charge of the plumbing department, and Mr. A. M. Morse of the machinery department.

R. N. Nelson, president of the Commercial Bank, of Selma, Ala., and Edward G. Gregory, president of the Union Iron Works, and also chairman of the Executive Committee of the new rolling mill in that city were in Pittsburgh last week for the purpose of buying machinery for the new mill, and also to hire a superintendent.

Neafie & Levy, of Philadelphia, have contracted with Aimes, Hollett & Co., of Syracuse, N. Y., for the propelling machinery of a large dredger, consisting of two compound engines each, with cylinders 15 and 26 inches diameter and 22 inches stroke, and two steel boilers for 100 pounds steam. Jackson, Sharp & Co., of Wilmington, Del., will build a hull of the boat.

John H. Dialogue has begun work on an iron tug for the New York Central Railroad Company, for service in New York Harbor. She will be about 100 feet in length.

The Curtis Regulator Company, of Boston, Mass., announce the following recent sales: Steam regulators from 1 to 5 inch, return traps, damper regulator, expansion traps, pump and water regulators and carbonic acid gas regulators, Massachusetts, 39; Connecticut, 1; Rhode Island, 1; New York, 20; Pennsylvania, 4; Ohio, 1; Minneapolis, 2; Nova Scotia, 2; Copenhagen, Denmark, 1; besides 9 for the car-heating system of the Boston and Albany and other railroads.

The De La Vergne Refrigerating Machine Company, of New York, have closed contracts this season for 41 of their refrigerating and ice making plants, a few of the most recent ones being with the following firms: Breweries: Bartholomay Brewing Company, Rochester, N. Y., two 50-ton machines; J. & P. Baltz Brewing Company, Philadelphia, Pa., two 50-ton machines; Leonard Eppig, Brooklyn, N. Y., two 50-ton machines; H. Clausen & Son Brewing Company, New York, one 50 ton machine; B. Stroh Brewing Company, Detroit, Mich., one 50-ton machine; F. C. Miller Brewing Company, Milwaukee, Wis., one 50 ton machine; W. G. Abbott Brewing Company, Brooklyn, N. Y., one 32 ton machine; M. Groh's Sons, New York, two 32-ton machines. Abattoirs and Packing Houses: W. H. Silberhorn, Lincoln, Neb., two 50-ton machines; Ryan Bros., Cincinnati, Ohio, one 32-ton machine; Hart & Bro., Wilmington, Del., one 18 ton machine. Artificial Ice Plants: Bohlen-Huse Machine and Lake Ice Company, Memphis, Tenn., one 50 ton machine; Enrico Maraini & Co, Rome, Italy, one 18-ton machine; E. M. Barretto, Manila, Phillippine Islands, one 9-ton machine. Chemical Works: Baugh Son & Co., Philadelphia, Pa., one 18 ton machine; M. A. Seed Dry Plate Company, St. Louis, Mo., one 9-ton machine. Hotels: Murray Hill Hotel, New York, one 9-ton machine. Markets: Leadenhall Market, London, England, one 32-ton machine. The company have now erected 143 machines in all parts of the world. These machines have a capacity equal to the melting of nearly 6000 tons of ice each 24 hours. In the brewery of Jacob Ruppert in this city three of their machines are in operation which have a capacity for doing the same cooling work as 330 tons of ice per day. They also have a plant of the same capacity in the establishment of George Ehret, brewer, in this city.

A new catalogue, now being sent out by the Holly Mfg. Co., of Lockport, N. Y., describes in detail the Gaskill fire hydrant and their stop gates, engravings representing general and sectional views being added. An inclosed circular gives some interesting data relating to the well-known Gaskill pumping engine.

An attractive catalogue, dated June 1, 1887, has just been issued by the Tanite Company, of Stroudsburg, Pa. It illustrates and describes in an interesting manner their various forms of emery grinding machinery, and contains comments on emery wheels in general. It embraces 32 pages.

Hardware.

It has been decided by Oliver Bros. & Phillips, and J. H. Baker, owners of the Baker Wagon Iron and Chain Works, at Beaver Falls, Pa., which were recently destroyed by fire, not to rebuild in the above place, but to remove the machinery, stock, &c., of the plant to Woods Run, Allegheny, to the works of Oliver Bros. & Phillips, now at that place. The reason assigned is that the works in which Oliver Bros. & Phillips are interested will be thus concentrated and the men can go to work in the buildings already there and orders now on the books can be filled at once. A number of the former workmen will go to Woods Run and part of the office force.

The New York Belting and Packing Company, 15 Park Row, New York, have issued a new catalogue relating to their vulcanite emery wheels and rubber belting. It is profusely illustrated, contains price lists, tables of sizes and descriptive matter, and will undoubtedly prove interesting to emery-wheel users.

Since the recent destruction of the factory of the Baker Chain and Wagon Iron Mfg. Company, Beaver Falls, Pa., the company have leased property from Oliver Bros. & Phillips, in Allegheny City, and will immediately remove to a fire-proof building there which is now occupied with their hinge machinery. This machinery will be taken out and stored so that it is expected that they will be at work this week making over 5 tons of chain per day. The company have ordered new hammers and other tools, many of which are already delivered, so that it is expected that by June 6 they will be in as good shape as ever for filling orders. The new buildings which they will occupy will be entirely fire-proof, being constructed of stone, brick and iron without a stick of timber.

Selby, Starr & Co., whose establishment at Peoria, Ill., was recently burned, were manufacturers of Union grain drills, broadcast seeders and other agricultural implements. They also built machines for the Acme Hay Harvester Company, and Perfection grain weighers for Weber & Harrison, of Princeville. The works will be rebuilt during the summer.

Keith & Trufant, manufacturers of wire nails and beads and wire carpet tacks, have removed their business from Campello to Whitman, Mass., having purchased the machines, &c., of D. A. Gurney & Co.

The Illinois Automatic Door Bell Company have been incorporated at Chicago with a capital of $10,000. Incorporators, Richard A. Allen, Charles F. Sinclair and A. J. Scarborough.

Miscellaneous.

The Johnstown (Pa.) *Tribune* says: "Every kind of outdoor workman in this vicinity has or can obtain all the work he can do. In the building interest carpenters, masons, plasterers, painters, &c., have their hands more than full. Of carpenters there is a short supply. So, too, of house painters. Laborers in digging natural gas and water gas trenches, sewers, and cellars, and in doing all the other work that is to be done, are kept as busy as they could wish. In every department of trade and industry Johnstown people are fully engaged, and there seems every reason to expect a long-continued season of prosperity."

A company composed of J. U. Camden, L. A. Cole, C. H. Shattuck, Henry Jackson, and Samuel Stewart, all of Parkersburg, W. Va., have been formed to bore for natural gas here. Within a few miles, on three sides, natural gas has been struck, and the opinion is that it can be found if a proper depth is reached.

Natural gas has been discovered in the vicinity of Blunt, Dakota Territory, and arrangements are being made for the development of the deposit. Great excitement is reported from the scene of the discovery, as might naturally be expected. This bountiful freak of nature is not to be monopolized by any section or limited portion of the country, having already been discovered over a wide area, and presumably existing in other locations not yet exploited.

The Standard Underground Cable Company, of Pittsburgh, have recently closed a contract with the District of Columbia for a system of underground wires for the police and fire departments, telephones, &c. There will be used 75,000 feet of cables, containing from 2 to 13 wires each. The first of a large shipment of cable to New York for the Western Union Telegraph Company was made last week. It embraced over 300 miles of wire. The contract with this company is for 2000 miles, the cables containing 19 to 30 wires each. This contract will take two weeks to fill. The work in New York will be begun in a few days.

The Pusey & Jones Company, of Wilmington, Del., have contracted with the Government of the United States of Colombia for a revenue cutter, to be 120 feet long, 20 feet beam and 10½ feet deep. Berwind,

White & Co. are having two coal barges built by D. McCarthy, of New York, each with a capacity of 600 tons.

Among the corporations recently authorized to begin business in Illinois are the following: The Western Natural Gas Company, Mendota, with a capital of $100,000, and C. O. Godfrey, M. A. McKey, and L. R. Curtis as incorporators. The Southern Tool Company, Centralia, capital, $36,000, and S. M. Warner, E. S. Condit, M. H. Monkhouse, W. P. White, and Ferdinand Kohl, incorporators. The Chicago Carriage and Cutter Company, Chicago, with a capital of $300,000, and Caleb B. Hitchcock, Henry L. Gleason and M. M. Towle as incorporators, for the purpose of manufacturing carriages, cutters, all kinds of agricultural implements, &c.

The P. & R. Co., want 4000 new coal cars to be built at once for the fall trade, but as the court will allow the company to pay only five per cent for borrowed money, the company thus far has failed to get the cash. The lawyers are getting up a new scheme to raise the money. The cars will be built here.—*Reading, Pa., Times.*

The Quincy Metal Wheel Company, Quincy, Ill., have shipped over 100,000 of their wheels so far this season, for agricultural implements.

The works of the Star Encaustic Tile Co., of Pittsburgh, which were completely destroyed by fire some weeks ago, will be rebuilt on a much larger scale than before. The new works will be 120 x 140 feet, and will be pushed to completion as rapidly as possible, as the company have a number of large contracts on hand, among which is one for 40,000 feet of tile for the new Court House now being erected in Pittsburgh.

The Wayne Agricultural Works, of Richmond, Ind., have made an assignment. The annual statement in December represented resources aggregating $315,000, an excess of $100,000 over liabilities, and the company claim nearly as much now, but they are not available to meet obligations aggregating $34,465.

The E. A. Reiten Furnace Repair Company have been incorporated at Chicago, with a capital of $2000. Incorporators, E. A. Reiten, F. I. Rice and T. D. Hurley.

The spun copper works and other shops belonging to Woodward & Schwest, at Springville, N. Y., were burned May 24 by a fire which originated in the boiler room. The loss includes $1500 worth of new kettles, packed for shipping. At Lake View, Ill., May 23, Worth Bros.' foundry was damaged by fire to the extent of $6000.

Messrs. E. C. Atkins & Co., Indianapolis, Ind., manufacturers of circular and cross-cut saws, recently placed in position at the Hurd Mill, Xenia, Ind., what is probably the largest and thinnest circular saw ever turned out by any firm. Its diameter is 88 inches, the material used being necessarily of the very best quality of steel attainable, and of No. 12 gauge. The saw is being run at the rate of 410 revolutions per minute.

Tin-Plate Working in England.

Few among the industries of the Midlands, says the London *Ironmonger*, have been more completely revolutionized by the introduction of machinery than that of tin-plate working. It seems almost incredible that so recently as half a century ago the majority of tin-plate wares were constructed by manual labor of small pieces of material soldered together and shaped by processes at once laborious and slow. About the year 1836 the invention of stamping and burnishing opened out to the view of intelligent observers great and important possibilities in the future development of this industry. The names of Thomas Griffiths and J. H. Hopkins are prominent among the more enterprising members of the trade at this period of its new departure. Coffee pots and candlesticks were the first articles experimented upon, and the results were so successful that stamping by machinery soon became general in the trade. In 1840 what was regarded as a triumph in stamping was accomplished by a machine capable of stamping the top of an 18-inch imperial dish cover. This stamp was known as the Monster, and its operations attracted to Birmingham many curious and not altogether disinterested observers. From this time the industry underwent rapid development, not only in Birmingham, but also in Wolverhampton and other Midland towns. A few years later the tin plate workers turned their attention to the stamping of such culinary articles as colanders and gravy strainers, and also of wash-hand basins, &c. In the making of these articles sheet iron was used, and the articles were tinned by the same process as that employed by the tin plate makers. Tinned wrought hollow-ware was the name given to these products, and quite a new impetus was imparted to the trade, milk pans and "prospecting" pans for the colonial markets being conspicuous among the newer features of demand.

The system of pressing employed by the English tin-plate workers—that of pounding the material into the required shape by a sharp blow—was, however, by no means perfect or even satisfactory. Some rival makers on the Continent, and more particularly in France, employed with much better results a "pressure-plate" and a gradual forcing process. In other words, they substituted for the operation of "stamping" that of "pressing." The advantages of the latter over the former method in the production of certain classes of goods were at once obvious. Shapes and designs in curves and angles were attainable by the system of pressure, which could not have been reached by a sharp and sudden blow. The French system was patented, but the patent right for this country was purchased by the late Mr. Clutton Salt, of Birmingham, by whom licenses were granted to other manufacturers. The invention was soon improved upon, and great strides of progress were made in a few years, particularly in regard to the size of the vessel produced. In these improvements a leading part was taken by a Birmingham man named Page, who, in 1866, emigrated to America and erected for a New York firm a number of machines on the French plan, but with his own improvements, which both economized material and accelerated production. One of the largest and most powerful of the machines on Page's new principle now in existence was erected in 1872, in Birmingham, under Mr. Page's supervision. This improvement in the manufacturing process led to an extraordinary development in the trade once known as "stamped tin hollow-ware," but now generally called "pressed bright tin hollow-ware."

Among more recent improvements those which have been made in the process of decoration are not the least important. The old stencil plates have been superseded by "transfers," and the japanning of articles with backgrounds highly polished has been superseded by a dead morocco-like surface in low tones, an improvement which affords highly pleasing results. Birmingham and Wolverhampton are the chief Midland towns producing tin-plate wares, but there are also important manufactories in London, Reading, Sheffield and other towns. The home demand for these classes of goods is very large, and they also find a ready market in New Zealand, Australia, the Cape, East Indies, South America and other export markets. Like all other classes of Midland hardwares, the price of tin-plate wares, which includes a list of articles as long as the line-of-battle ships in "Homer," has, during the last few years, undergone a very considerable reduction.

Action of Oils on Metals.

Mr. J. J. Redwood publishes in the *Journal of the Society of Chemical Industry* the following interesting account of the action of oils on metals:

Very little has yet been published in regard to the action of oils in common use on metals with which they are brought in contact when stored, transported, or employed for the lubrication of machinery; and as the subject is one of importance, especially to manufacturers of compound lubricating oils, and to those who use such oils, the following record of the results of experiments extending over 12 months will, it is confidently hoped, be found of practical value. The experiments were made principally with a view to determine what fixed oils are best adapted for mixing with mineral oils for lubricating purposes. The metals were first thoroughly cleaned, and washed with ether and dried, and, after being weighed, placed in cork tubes together with 15 c. cm. of the oil, the tubes being kept for 12 months at an average temperature of about 80° F. in the summer, and at 50° F. to 55° F. in the winter. The results of the experiments show that—

Iron is least affected by seal oil and most by tallow oil.

Brass is not affected by rape oil, least by seal oil, and most by olive oil.

Tin is not affected by rape oil, least by olive oil, and most by cotton-seed oil.

Lead is least affected by olive oil and most by whale oil, but whale, lard and sperm oils act to very nearly the same extent on lead.

Zinc seems, by the four actual weighings that were of any value, to be not acted on by mineral lubricating oil, least by lard oil, and most by sperm oil.

Copper is not affected by mineral lubricating oil, least by sperm oil, and most by tallow oil.

Conversely—

Mineral lubricating oil has no action on zinc and copper, acts least on brass and most on lead.

Olive oil acts least on tin and most on copper.

Rape oil has no action on brass and tin, acts least on iron and most on copper.

Tallow oil acts least on tin and most on copper.

Lard oil acts least on zinc and most on copper.

Cotton-seed oil acts least on lead and most on tin.

Sperm oil acts least on brass and most on zinc.

Whale oil has no action on tin, acts least on brass and most on lead.

Seal oil acts least on brass and most on copper.

From the foregoing results it will be seen that mineral lubricating oil has, on the whole, the least action on the metals experimented with, and sperm oil the most.

For lubricating the journals of heavy machinery, either rape or sperm oil is the best oil to use in admixture with mineral oil, as they have the least effect on brass and iron, which two metals generally constitute the bearing surfaces of an engine. Tallow oil should be used as little as possible, as it has considerable action on iron.

The Knights of Labor, the New York *Sun* shows, lost 42,076 members from July 1, 1886, to April 1, 1887, in 10 district assemblies, which had at the earlier date 104,469 members, and at the later 61,793. These assemblies, one of which is "No. 126," just suspended because it would not give way to the reckless men who control "No. 49," have lost over two-fifths of their membership, and there is no reason to suppose that the order through the country has not suffered in like proportion. We doubt if it has to-day even two thirds as many members as it had enrolled before the strike on Gould's Southwestern roads just 15 months ago. In three great strikes since then, and in scores of lesser struggles, it has made a miserable failure. The attempt to put the world of labor in a sling, so to speak, does not seem thus far to have been an alarming success. Yet, with moderation, with less perpetual managing and greater willingness to let local and district assemblies take care of themselves, the order has a field of usefulness before it great enough to satisfy its most enthusiastic leaders.

Bottom plates for the Celtic and Britannic, which came into collision recently, are being made at Harrisburg, Pa. About 50 tons of iron and steel plates, ranging from ⅝ to 1 inch in thickness and weighing from a few hundred to 2000 pounds each, are required for each vessel. The plates for the Celtic have already been shipped, and those for the other steamer will be forwarded this week.

Saw-Mills.

The first saw-mill put in operation in Massachusetts, says *Wood and Iron*, was in 1633, a dozen years after the landing of the Pilgrims on Plymouth Rock. But subsequent emigrants, to people New Hampshire and Maine, who had landed at Portsmouth, got a mill in operation at Salmon Falls during 1634-5. These mills served for both sides of the Piscataqua River, emptying into Portsmouth Harbor, from which in subsequent years great quantities of lumber and timber were shipped to the West Indies and other parts of the New World. Maine, east of the Piscataqua, had as early as 1652 24 saw-mills, whose owners sold lumber at 19 shillings per 1000 feet. In 1840 Maine reported 1300 mills, and lumber worth $10 per 1000 feet. During these 158 years all other property, as well as the population of Maine, had appreciated similarly in value. Yet during many of these early years (from 1675 to 1690) the Indians and the French from Canada killed many of the inhabitants and burned all the mills into which they could thrust a torch. These marauders also took back with them to Canada numerous captives and held them until their friends could redeem them. Among these captives was a man named Sawyer, an ingenious millwright. Having proofs of his skill, the Canadians offered him his liberty on condition that he would build a saw-mill, and teach them to manage it. This he did at Chambly, near Montreal. This was the first saw mill put in successful operation in Canada, and this was the price Sawyer paid for his liberty in 1706.

The other middle colonies were but little behind New York in building and patronizing saw-mills, but a few hardy centenarians remember the advent of the saw mill into the territory northwest of the Ohio River. The first mill was erected near Marietta in 1789. Major Hatfield and Captains Oliver and Dodge, soldiers of the Revolution, received an allotment of land for superintending and securing a good saw-mill for this first pioneer settlement of the embryo State of Ohio. The mill "crank" was made in New Haven Conn. It weighed 180 pounds, and was transported over the Allegheny Mountains on pack horses and then placed in a flat boat on the Youghiogheny River, in which it floated to the Ohio and down that river to Marietta.

Daniel Sherwood, a well known citizen died in Lowell, Mass., May 24th, aged 58 years. He was born in England and came with his parents to Lowell when he was a boy and learned the tinsmith's trade with the firm of Bangs Bros., who were the predecessors of H. H. Wilder & Co. Later he worked at his trade for a number of years on the Massachusetts corporation, having charge of the work of the company in tinning. In 1861 he became connected with the firm of Woods, Sherwood & Co., wire goods manufacturers, and was with that company at the time of his death. In connection with his business, Mr. Sherwood made a number of inventions in wire articles and secured patents on them.

Locomotive boilers frequently explode, in spite of all assertions to the contrary. There were 22 locomotive boiler explosions in this country in the year 1886—more than there were among any other class of boilers except saw-mills and wood-working establishments.

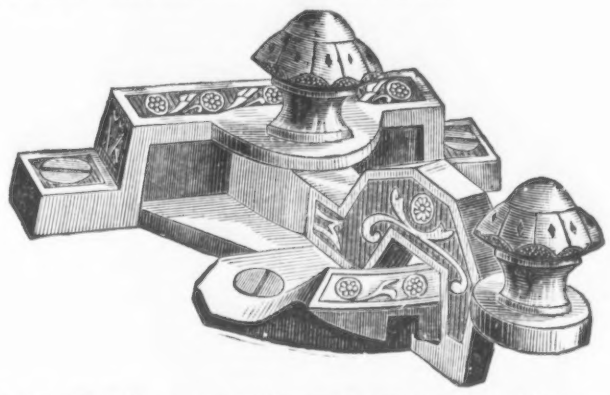
CONTENTS.

PAGE

The Robinson-Rea Ingot Manipulator. Illustrated 1
Nickel and Its Alloys 9
Changes at the Brooklyn Bridge 9
English Letter 11
The Use of High Steam Pressure 13
Foreign Markets 13
Wages in Sheffield 15
The Burlington Brake Tests 15
The Week 17
Mechanical:
New Return Flue Boiler and Super-heater. Illustrated 19
Tight vs. Slack Car Couplers 19
Baughman's Boiler Tube Cutter. Illustrated 19
Scoop Wheels for Drainage Purposes 19
A New Railway Spring Testing Machine 19
Double Corrugating Machine. Illustrated 19
Editorial:
The Character of Our Immigration 20
Australian Progress 20
The Position of Non-Union Men 20
Cost of Transportation 20
The Soft Steel Trade 21
Iron and Manganese Ores in North Carolina and Georgia 21
The Iron Age Directory 22
Duplex Door Check. Illustrated 23
The Artful Animal Trap. Illustrated 23
Filtering Joint for Conductor Pipe. Illustrated 23
Vortex Coffee Mill. Illustrated 23
Domestic Steam Washer. Illustrated 23
The Unique Screw Holding Screw-Driver. Illustrated 23
The Buckell Safety Clevis. Illustrated 23
The Daisy Dust Pan. Illustrated 23
The Triumph Toy Clothes Wringer. Illustrated 23
The Mines of the Kingston and Pembroke Company 23
The International Railway Exposition at Paris 23
Current Hardware Prices 26
Trade Report:
British Iron and Metal Markets 28
Financial 28
General Hardware 28
New York 32
Metal Market 32
New York Metal Exchange 32
Philadelphia 32
Pittsburgh 32
Chicago 32
Chattanooga 33
Cleveland 33
Cincinnati 33
Louisville 33
Detroit 34
Coal Market 33
Old Metals, Rags, &c 33
Combination Pipe and Bench Vise. Illustrated 29
Liability of Mercantile Agency 29
The Coke Strike 29
Laying Off Boilers 29
Wholesale Metal Prices 30
The Chicago Builders' Lockout 31
Natural Gas Celebration at Findlay, Ohio 31
An Administration Tariff Bill 31
Apparatus for Steaming Locomotives 33
Imports 35
Exports 35
Imports for the Week Ending May 28 35
Manufacturing:
Iron and Steel 35
Machinery 35
Hardware 35
Miscellaneous 35
Tin-Plate Working in England 36
Action of Oils on Metals 36
Saw Mills 36
Philadelphia and Pittsburgh Hardware and Metal Prices 45

THE READING LOCK MANUFACTURING CO.,
READING, PA., U. S. A.,
— MANUFACTURERS OF —
LOCKS OF EVERY DESCRIPTION,
AND A FULL LINE OF
GENERAL BUILDERS' HARDWARE.

BROUGHTON'S BURGLAR-PROOF SASH LOCKS.
Patented Oct. 7th, 1879.



No. 210, Ornamental Iron, Iron Knob, fine finish, Etruscan Bronze	$0.60
No. 211, Ornamental Iron, Iron Knob, fine finish, Olympian Bronze	.75
No. 212, Ornamental Iron, Iron Knob, fine finish, Pompeii Bronze	.85
No. 213, Ornamental Iron, Iron Knob, Nickel-plated	1.25
No. 214, Ornamental Iron, Iron Knob, Nickel-plated, Rich Old Gold inlaid	1.50
No. 215, Ornamental Iron, Iron Knob, Nickel-plated, Pale Old Gold inlaid	1.60
No. 216, Ornamental Iron, Iron Knob, Nickel-plated, Fire Old Gold inlaid	1.75
No. 217, Ornamental Iron, Iron Knob, Nickel-plated, Crimson Old Gold inlaid	$1.85
No. 218, Ornamental Iron, Iron Knob, Nickel-plated, Blue Old Gold inlaid	1.90
No. 219, Ornamental Iron, Iron Knob, Nickel-plated, Green Old Gold inlaid	1.95
No. 220, Ornamental Iron, Iron Knob, Nickel-plated, Copper Old Gold inlaid	2.00
No. 221, Ornamental Iron, Iron Knob, Nickel-plated, Lemon Old Gold inlaid	2.05
No. 222, Ornamental Cast Brass, Polished and Lacquered	2.65
No. 222, Ornamental Cast Brass, Nickel-plated	3.60

Special net prices to be found in *Iron Age* whenever changes occur.
The only manufacturers in the United States who quote bottom prices to all dealers without favoring any class.
Fine Gray Iron Castings of every description, also Real Bronze and Brass Castings, made to order very low prices. Pattern Making, Japanning, Bronzing, Tinning, &c.
Our goods are known and liked wherever sold.
We do no underhand business, but quote alike to all for quantities less than $1000.
Our terms are strictly 15 days f.o.b. Reading, no charge for cases or cartage.

KOLB'S
Common Sense Screw Driver

IT MAKES A PERFECT GIMLET. IT IS EASY TO WORK. NEAT AND CHEAP.

TRY IT AND BE CONVINCED.

By a very simple sliding attachment to an almost ordinary shaped screw driver, a tool is here produced by which the screw is held firmly to the driver, enabling the same to be started and driven in much less time, and without the least danger of slipping out of the slot, or toppling over of the screw. It is very valuable to use in corners, overhead, or any place unhandy of access; *one hand can hold the work, while the other drives the screw; and to drive it home the jaws are simply pushed back without stopping driving and without taking the driver out of the slot.*
In taking out a screw, loosen it first with a few turns, apply the jaws and it will come out easy.
In driving a screw, you do not need to press against as with an ordinary driver, because you cannot lose hold of it. The pressing does not help it; a screw when once started needs only turning and it will draw itself in.
This is a well-made, strong tool, the blade and jaws are of best quality steel, polished brass mountings and ebonized handles.
MEDIUM SIZE, NEARLY 10 INCHES LONG OVER ALL.
Silver Medal awarded at Novelty Exhibition, Philadelphia, 1885.

DIEBEL MANUFACTURING COMPANY,
PHILADELPHIA, PA., U. S. A.

Electro-Plating
TO ORDER.
SILVER, GOLD, NICKEL, BRASS AND BRONZE
— ON —
Spelter, Iron, White Metal, &c.
Estimates given on receipt of samples and statement of quantities.
ROGERS SILVER PLATE CO.,
Danbury, Conn.
N. BURTON ROGERS, (Late of Meriden), SEC'Y AND SUP'T.
DWIGHT E. ROGERS, Pres't.
FRED. A. HALL, Treas'r. (Of Hall & Rogers).

AMERICAN OIL STOVES,
BABY AMERICAN LAMP STOVES.
SEND FOR CATALOGUE.
AMERICAN OIL STOVE CO., GARDNER, MASS., U. S. A.

L. W. FERDINAND & CO.
Jobbers and Retailers of
Heavy and
SHIP CHANDLERY HARDWARE,
Tackle Blocks and Cordage,
267 Federal St., Boston, Mass.
SEND FOR CATALOGUE.

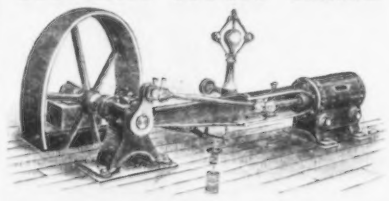
ENGLISH TRADE.
Having spacious premises in the city of London and a good wholesale connection, we are prepared to introduce good specialties or work patents.
BRITANNIA COMPANY,
100 HOUNDSDITCH, LONDON.
Tool Makers to the British Government.

GAY'S DUPLICATE
Mail Forwarding Book
PRICE, 35 CENTS.
Mail Forwarding Orders, PLAINLY AND ACCURATELY MADE OUT, should always be left with hotel keeper, Postmaster, your customer, or any party to whom is intrusted the duty of forwarding your mail. PROPER ATTENTION TO THIS will be of great advantage. This blank order (properly filled out, being exact size of postal card, is of convenient size for keeping in letter rack under your initials at hotel or post-office, and will there MORE READILY catch the eyes of party forwarding mail.
These blanks will be found convenient for using as "time card" or "route sheet," for use of your "house."
The "Stub," filled out, will be convenient for future reference; can be used as evidence in case of error in forwarding mail, &c.
Sent, *post-paid*, on receipt of the price by
DAVID WILLIAMS, 66 and 68 Duane St., New York

WILLIAM MANN, Jr. & CO.,
MANUFACTURERS OF
Axes and Edge Tools,
LEWISTOWN, PA.

To Manufacturers of Light Hardware.
A New Picture Hanger,
By which Pictures, Mirrors, Maps, Show-cards, &c., &c., can be hung at any desired angle. Needed in every House, Office, School, Museum, College and Picture Gallery in the country.
A Bonanza to Right Parties.
The patentees would be pleased to negotiate with manufacturers with view to manufacturing and introducing the same on royalty. Circulars and samples on application. Address
E. WILKINSON, Paterson, N. J.

THE "TWISS" PATENT
AUTOMATIC CUT-OFF ENGINE.



A STRICTLY FIRST-CLASS ENGINE AT A VERY LOW PRICE.
— MANUFACTURED BY —
NELSON W. TWISS,
25 Whitney Avenue, - NEW HAVEN, CONN.
Send for Price before Purchasing Elsewhere.

WOOD ENGRAVING, ELECTROTYPING, AND PRINTED SUPPLIES.
Manufacturers Wood Engraving, Electrotyping and Printing.
Publisher of THE MANUFACTURERS' EXCHANGE.
A. MUGFORD, Hartford, Conn.

SIFTERS

OVER 10 MILLION SOLD.

FOR

FLOUR

HUNTER'S
ELECTRIC LIGHT AND
FOUR-PIECE
MANUFACTURED BY
The FRED J. MEYERS MFG. CO.,
COVINGTON, KY.

JAMES P WITHEROW,

Engineer & Contractor

LEWIS BLOCK,

PITTSBURGH, PENNSYLVANIA,

GENERAL AGENT FOR

WHITWELL FIRE-BRICK STOVES

AND

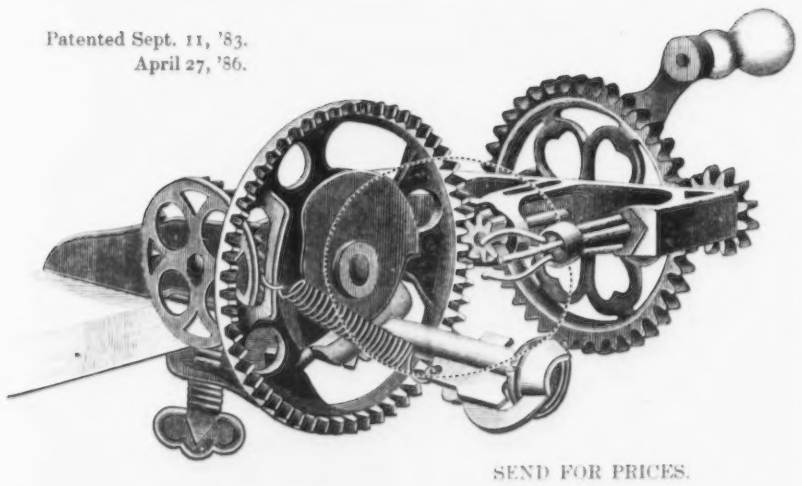
Clapp-Griffiths Patents for Manufacture of Soft Steel,

SPECIALLY ADAPTED FOR A No. 1 BOILER PLATES, BOILER RIVETS, WIRE RODS, STAY BOLTS, STAMPING WARE, NAIL PLATES.

Will contract to completely erect, equip and place in operation Blast Furnace Whitwell Stoves and Steel Plants as above. As I manufacture at our own works everything appertaining to Blast Furnace and Steel Works construction, can guarantee promptness and satisfaction.

THE MONARCH PEACH and APPLE PARER,

Patented Sept. 11, '83.
April 27, '86.



SEND FOR PRICES.

L. A. SAYRE,

NEWARK, N. J.

THE E. J. MANVILLE MACHINE CO.,
BUILDERS OF
Automatic Machines
FOR WORKING WIRE AND METAL IN ANY FORM DESIRED.
Hand, Clock, Spinning, Trimming, Tapping, and Buffing Lathes.
Hair, Drapery and Common Dress Pin Machinery.
Machines for Rolling Threads on Screw Blanks. Punches, Dies and Tools of all kinds.
Power and Foot Presses. Drawings and Patterns a Specialty.
86 MEADOW ST., WATERBURY, CONN.

Double Acting Spring **BUTTS** SABIN'S LEVER DOOR SPRINGS
Coil, and Sabin's Volute Springs
For various purposes made to order.
SABIN MACHINE CO., Montpelier Vt.

Gate City Stone Filter Co.,

This open cut represents our China Filters with Filter Disc and
Patent Ice Chamber.
By this arrangement the filtered water is cooled without mingling with the ice.

Office and Salesroom at
46 Murray Street,

Manufactory and Depot at
UNION PORCELAIN WORKS,
GREENPOINT, N. Y.

Impure Water is Poison. Best Filter ever Invented.

Price $3.75 to $41.25 each,
according to size and style.

This open cut represents our Stoneware Filters in operation, showing the Stone Disc through which the water is filtered.
These Filters have no Ice Chambers.

Cheap Stone Jar Filters for the kitchen. Fine Porcelain (with Ice Chambers) for dining-rooms, halls and offices. ***Lasts a lifetime without change. NO METAL USED.*** All common metals generate poison when in contact with water. ☞ ***No Charcoal, Sand or other Compound used. They all absorb, retain and become foul with Living Organisms.*** ☞ ***Charcoal has no Chemical effect on water. Our Filtering Medium is a Natuarl Stone.*** No matter whether the impurities are organic or inorganic, they are left on the surface of the stone, which is as easily cleaned as an ordinary water pail or pitcher.

For Circulars, Price Lists and Discounts address New York Office.

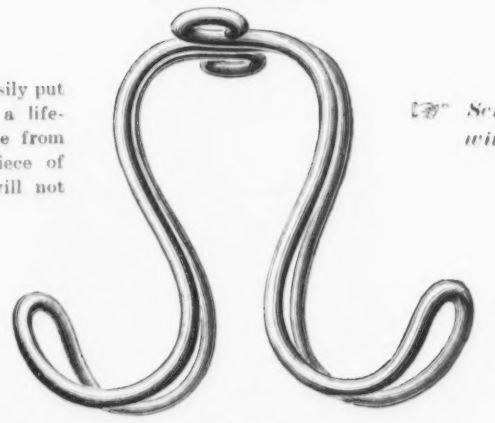
THE UNION PORCELAIN WORKS manufacture Hard Porcelain Insulators, large and small, for ***Telephone, Telegraph and Electric Work, Door Plates and Hardware Trimmings.***

THE INDESTRUCTIBLE

CEILING HOOK,

3-4 SIZE.

This Hook is easily put up and will last a lifetime, as it is made from one continuous piece of Steel Wire and will not break or bend.

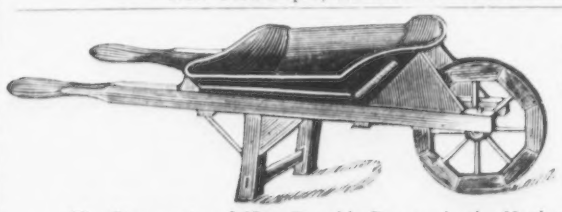


☞ *Screws packed with Hooks.*

PATENTED.

MANUFACTURED ONLY BY

THE PERKINS AND BRADLEY MFG. CO.,
MANUFACTURERS OF
Patented and Special Wire Hardware.
Box 1404 A. NEW HAVEN, CONN.
New York Depot, RUSSELL & ERWIN MFG. CO.

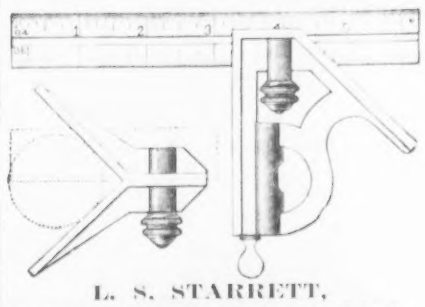


I MANUFACTURE THE
STANDARD
R. R. or Levee Oak
Barrow as a Specialty.

The Strongest and Most Durable Barrow in the Market. Write for Prices.
HENRY PRESCOTT, Portsmouth, O.

PHILADELPHIA
DROP FORGE COMPANY,
Iron and Steel Drop Forgings,
1229 Callowhill Street,
PHILADELPHIA, PA.

J. E. QUACKENBUSH & SON,
MANUFACTURERS OF
Porcelain, Mineral & Jet Knobs & Escutcheons
Send for Price List and Terms. | Office and Salesrooms: 313 & 315 W. 37th St., N. Y.



L. S. STARRETT,
MANUFACTURER OF FINE TOOLS
Box L, Athol, Mass.
Send for full list of New Tools.

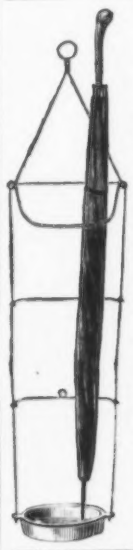
Ladd's Discount Book
Accurate, Rapid, Practical.

$3.00 $3.00

A practical means for rapidly reaching absolutely accurate results without the mental wear of computing. Every Hardware House in the United States and Canada should use it.

PRICE, THREE DOLLARS.

Will be sent, postpaid, to any address upon receipt of price by
DAVID WILLIAMS,
66 & 68 Duane St., New York.



"The World's Favorite"
IS
COVERT'S
WET UMBRELLA RACK.

Something that everybody wants at sight for their Church Pew, Office, Store, Dwelling and Piazza. It entirely prevents a wet umbrella from soiling anything. The frame is wire, and the drip pan metal, and finished in C plate, or Japanned. The drip pan rests by its rim, therefore easy to detach. The rack is held in place by two screw hooks which go with it. The price brings it within the means of everybody. The demand for this useful article is world wide, and the invention will be fully covered by letters patent in every civilized country. Order of your Jobber. Price per doz., $5.00. Will send sample on receipt of price.

E. & J. C. COVERT,
Farmer Village, N. Y., U. S. A.

"Core Flour" and "Core Molasses."

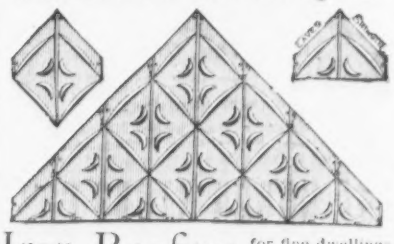
FLOUR. After (15) fifteen years' experience in making and selling my compound (improved quality), I offer the following inducements: It will not shrink or swell, has no gas, and requires one-third less quantity than Flour. Price low.

S. W. Pearce is the only manufacturer of Core Compound.

MOLASSES. Foundries all over New England are fast giving up "Sour Beer" and are using "Molasses" instead. I guarantee it to be cheaper, and even at same price, it is much better for core work. Very truly yours,

S. W. PEARCE,
34 and 35 SOUTH WATER STREET,
PROVIDENCE R. I.

Anglo-American Iron Roofing Co.



Iron Roofing for fine dwellings. Galvo-leaded, Kalameined or Painted. Handsome, light and durable.
ROOM 809, PENN BUILDING, - PITTSBURGH, PA.

COBB'S SQUARE CUT IRON NAILS

For all Practical Purposes

are superior to any other make of nails. They are the *only* square cut nails in use. The *only* nail made without turning the plate over, hence the *only* nail whose feather edges are *diagonally* opposite. This quality insures at least 25% *greater holding power* than nails have when cut by the old style processes.

COBB'S NAILS

are all made from selected Wrought Iron Scrap, and not Pig or Pot Metal. Wrought Iron Scrap makes a tough and stiff nail, yet it can be broken when you want to break it; steel nails cannot, they are sometimes *very* brittle, again *bend like lead*. Iron Nails *can be sold cheaper* than steel nails because they can be made cheaper.

COBB'S IRON AND NAIL CO.

now offer their Iron Nails at $1.75 rate f. o. b. *Aurora, Ind.* Net Cash, 10 day draft.

ORE JIGS.

The attention of Hematite ore miners is called to our new Jig. The simplest and most effective separator now in use.

McLANAHAN & STONE,
Gaysport Foundry, Hollidaysburg, Pa.
Manufacturers of Ore Washers, Screens, Elevators, Conveyors, any general Ore Mining Machinery.

JOHN T. LEWIS & BROS.,
SUCCESSORS TO MORDECAI LEWIS.
Established 1772.

JOHN T. LEWIS & BROS. PHILADA. WARRANTED PURE WHITE LEAD.

TRADE MARK.

White Lead in oil, the most reliable for Whiteness, Fineness, Body, and Covering Capacity.
RED LEAD, Litharge and Orange Mineral.
PAINTERS' COLORS of a Very Superior Quality
LINSEED OIL, Raw, Boiled and Refined.

ATLANTIC WHITE LEAD & LINSEED OIL CO. ROBERT COLGATE & CO. WARRANTED PURE WHITE LEAD. TRADE MARK.

ATLANTIC WHITE LEAD and LINSEED OIL CO.,
MANUFACTURERS OF
"ATLANTIC" PURE WHITE LEAD, unequaled for Uniform Whiteness, Fineness and Body. The most reliable White Lead made. RED LEAD and LITHARGE.
Raw, Refined LINSEED OIL and Boiled
287 Pearl St., New York.

ESTABLISHED 1853
HOWSON & SONS
ATTORNEYS AT LAW
AND
SOLICITORS OF PATENTS
119 South Fourth Street
PHILADELPHIA, PA.
Branch. 915 F Street, WASHINGTON, D. C.

PATENTS

U. S. AND FOREIGN SECURED.
Trade Marks and Labels Registered. **15 years' experience.** 4 years Examiner in U. S. Patent Office. Patent Causes litigated in the United States and Supreme and Circuit Courts. Expert Searches and Opinions as to Scope, Validity and Infringement of patents, citing prior art and authorities on which conclusions are based. Opinions rendered are complete basis for a Bill in Equity, or an answer in defense thereof. PATENT PRACTICE EXCLUSIVELY.
Send Model or Sketch of your invention for FREE opinion whether patent can be secured, and new 60-page book, citing recent court decisions.
Specially posted in the arts of Paper, Wood and Metal Working, Stoves and Paper Metal and Wire articles, and court decisions concerning the same.
In justice to the publisher and for my information, *please* mention this paper. OFFICES 611 F STREET.
Address E. B. STOCKING, Attorney, Washington, D. C.

Grindstones, Emery, &c

The Cleveland Stone Co.,
Manufacturers of
Grindstones, Mounted Stones, Scythe Stones, &c., Building Stone and Sawed Flagging.
Cleveland, Ohio.

BRANCH OFFICES:
Cor. Erie and Kingsbury Sts., Chicago, Ill.; 19 Milk St., Boston, Mass.; 407 Walnut St., Philadelphia, Pa.; 49 Fifth Ave., Pittsburgh, Pa.

LAKE HURON STONE CO.
MANUFACTURERS OF
Lake Huron Grindstones, Mounted Stones, Scythe Stones, &c., also Ohio Grindstones,
672, 674, 675, 677 Atwater St., Detroit, Mich.
34 and 36 Roberts St., Chicago, Ill.

WRITE FOR OUR NEW ILLUSTRATED CATALOGUE IN COLORS. OUR "HURON CHIEF" AND "MICHIGAN" ARE THE LATEST AND BEST IMPROVEMENTS IN MOUNTED STONE, HAVING ADVANTAGES OVER ALL OTHER KINDS.
Compare our Prices and Goods with others.

Walter R. Wood,
GRINDSTONES,
Berea, O., Nova Scotia & other brands.
283 and 285 Front St., New York.

GEO. CHASE.
GREEN PAPER BRAND TRADE MARK WASHITA STONE
Genuine Green Paper Brand Washita Stone is the Best
OIL STONE.
7th St., Harlem River, N. Y.

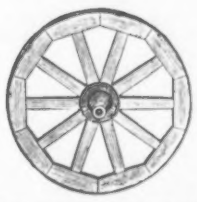
THE NEW "L. C. SMITH" HAMMERLESS GUN.

This new gun embodies all the essential features of our hammer gun, together with a new oscillating cocking mechanism and automatic and independent safety combined. This gun is not equaled in ease of manipulation, symmetry, durability and shooting qualities by any hammerless gun made.
Of the eleven gentlemen who broke 100 straight inanimate targets for a place in the Camberlin Cartridge Tournament prizes, five of them used the "L. C. Smith" gun. The following are the gentlemen: D. C. Powers, Cleveland, Ohio; Andy Meaders, Nashville, Tenn.; H. McMurchy, Syracuse, N. Y.; Fred Erb, Jr., La Fayette, Ind.; J. C. Hendershot, Cleveland, O.

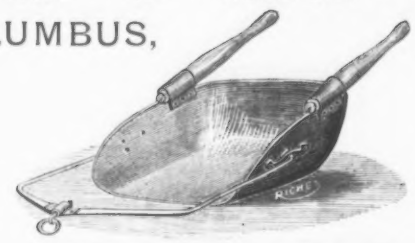
SEND FOR DESCRIPTIVE CATALOGUE AND PRICE LIST FREE.

L. C. SMITH, Manufacturer of Fine Hammerless and Hammer Guns, SYRACUSE, NEW YORK.

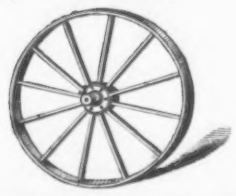
THE KILBOURNE & JACOB MFG. COMPANY,
COLUMBUS, OHIO, U. S. A.



Jacobs' Patent Wood Wheel.

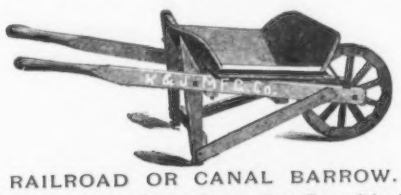


"Columbus" Solid Steel Scrapers.



Jacobs' Patent Steel Spoke Wheel.

Is pressed from *one solid sheet of heavy steel*, and is the strongest and most durable Road Scraper made. We make three sizes of these Scrapers. No. 1, Capacity, 7 cubic feet of earth. No. 2, 5 cubic feet of earth. No. 3, 3½ cubic feet of earth. Furnished with or without *solid steel shoes or runners*, as desired. We also furnish these Scrapers with *end gates* when so desired. The bails are of refined iron, with strong and perfect working swivels. Bowls nest and handles crate compactly for shipment.

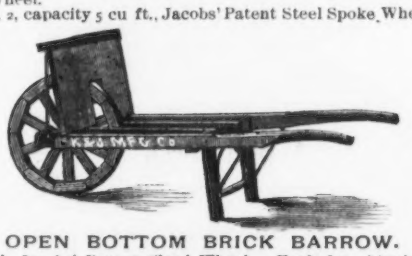


RAILROAD OR CANAL BARROW.
With Jacobs' Patent Wood Wheel. Bent Tray, full sized, planed and well finished.

"COLUMBUS" Solid Steel Tray Barrows.
No. 1, capacity 3½ cu. ft., Jacobs' Patent Steel Spoke Wheel.
No. 2, capacity 5 cu ft., Jacobs' Patent Steel Spoke Wheel.

We Also Manufacture
BRICK TRUCKS,
BRICK WAGONS,
Store and Warehouse TRUCKS,
Both Boston and Western Pattern

RAILROAD OR CANAL BARROW.
Same as above, except with Jacobs' Patent Steel Spoke Wheel.



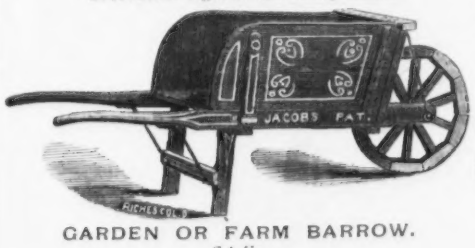
OPEN BOTTOM BRICK BARROW.
With Jacobs' Patent Wood Wheel. Folds for shipping, same as Garden or Farm Barrow.

Also,
SPECIAL TRUCKS of every kind.

ORE OR MORTAR BARROW.
With Jacobs' Patent Wood Wheel. All hardwood. Bowl *dovetailed* together and firmly nailed.

STRAIGHT HANDLE STONE BARROW.
With Jacobs' Patent Wheel. Strong, well-made, iron strapped over bottom and bolted together. For stone or pig iron, &c.

Baggage Barrows,
Express Wagons,
&c., &c.



GARDEN OR FARM BARROW.
Set Up.
Double Frames and so constructed that by simply removing one bolt (the axle) and two nuts they can be folded flat down (see cut) and shipped at lowest rate of freight. Three sizes.

Folded for Shipping.

BENT HANDLE STONE BARROW.
With Jacobs' Patent Wheel, 17¾-inch tire. Well ironed and bolted. Extra strong.

Also,
ROAD LEVELERS,
GRADERS,
EXCAVATORS,
&c., &c.
and
Wrought Steel Sinks.

STEEL BOTTOM STONE BARROW.
Bottom and Dash formed of *one plate of Steel one-fourth of an inch thick.* Steel Spoke Wheel. The stongest and best Stone Barrow manufactured. Very durable.

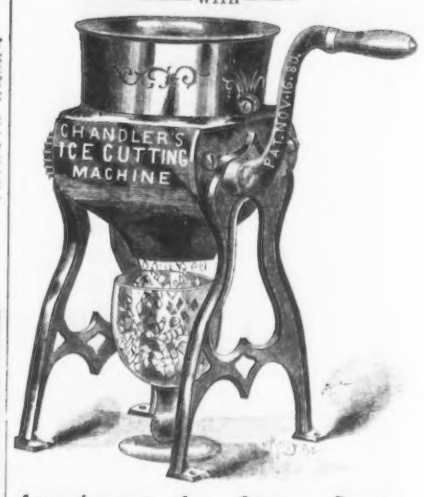
The Best, Strongest and Easiest Working
Wheel Scraper
Ever put on the market.

The bottoms of all Pressed Bowl Wheel Scrapers are OIL TEMPERED. The largest size of this Scraper, capacity 17 cubic feet, can be easily operated by ONE MAN, and is also much easier upon the team in filling, owing to the rounded shape of the Bowl. They cannot dump while filling. NO STRAIN ON HORSE'S NECK.

They have
"Sarven Patent"
Wheels, and are constructed throughout of the best selected material, and will outwear any other Wheelers manufactured.
We furnish these Wheelers, when so desired, with simple Automatic Front End Gate, warranted not to get out of order, that will carry the entire load over the roughest roads or down hill without loss.

THE "K. & J." PRESSED BOWL WHEEL SCRAPERS.
The Bowl is stamped from one solid plate of 3-16 inch steel, without joint, seam or rivet, and owing to the fact that they are pressed HOT, we are able to use much HARDER and STIFFER steel than is possible in the old style Square Box Scrapers, which are cut and BENT up COLD.
No. 2, Capacity 13 cubic feet. No. 3, Capacity 17 cubic feet.

CHANDLER'S
ICE-CUTTING MACHINE,
WITH



Attachment for Steam-Power.
Cuts Three Tons of Ice per Hour.
Any piece of ice that will go into the hopper will go through, being drawn in by the peculiar shape of the teeth. This arrangement is fully protected by letters patent, and cannot be used on other cutters.
Also make Four other Sizes:
No. 1, for Bar Tops and Soda Counters.
No. 2 for Family and Universal Use.
No. 2½, for Hotels, Hospitals and Boarding Houses.
No. 3, for large Hotels, Confectioners, &c.
SEND FOR PRICE LIST.
Address
G. IRVING ABENDROTH,
No. 28 Cliff Street, New York.

BOURKE'S PATENT NONPAREIL

WINDOW CLEANER.
The Best Window Cleaner now in the Market.
WHY?
1st. It is so constructed that the Rubber can never get out of the barrel without taking out the lock-pin.
2d. It differs from all other Rubber Window Cleaners, for when the edge of the rubber is worn smooth you can, by simply taking the pin out and reversing the edge of the rubber slip and pushing the pin in again, have a new Window Rubber.
3d. It can be used twice again by taking the lock-pin out and turning your rubber, using the near edge of the rubber slip and placing it for the outside, then reverse the whole thing again and you will have equal to four Rubber Cleaners.
When the four edges are worn smooth and worthless you can get at any hardware store a two-inch strip of rubber for a few cents and place the rubber in yourself. It is so simple that any child can do it.
For terms and prices address
BOURKE SASH LOCK CO.
231 E. Federal St., Youngstown, Ohio.

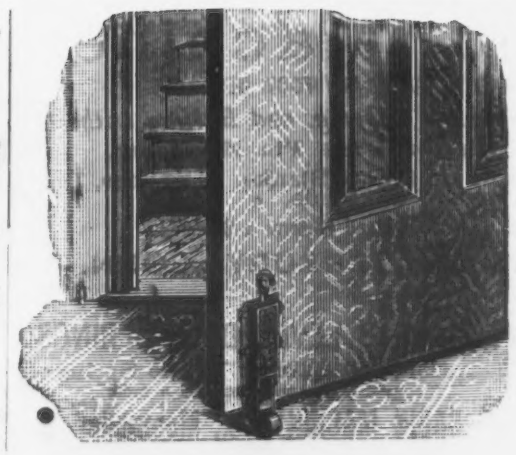
IVES' PATENT. SASH LOCK.

H. B. Ives & Co. NEW HAVEN, CONN.

BUFFALO STANDARD SCALES
AWARDED FIRST PREMIUM
AT THE WORLD'S EXPOSITION, New Orleans. (Four Gold Medals. All other principal makers competing). Track Scales, Hay Scales, Platform Scales, etc. Important patented IMPROVEMENTS. BEST VALUE for YOUR MONEY. For circulars, terms and full particulars, address
BUFFALO SCALE COMPANY, BUFFALO, N. Y.

COVERT MANUFACTURING CO.

BUY SNAPS, CHAINS AND ROPE GOODS
BEARING THE ABOVE TRADE-MARK.
They cannot be equalled in price and quality. Are standard the world over.
For sale by all leading Jobbers at factory prices.
Send for illustrated Catalogue and Price List.
Covert Manufacturing Co.,
WEST TROY, N. Y.



DOOR HOLDER
Coultaus' Patent.
PATENTED NOVEMBER 6, 1883.
Medal of Merit Awarded by the American Institute, New York, 1884.
The door is held in any desired position by the pressure of the roller on the floor, making it a most useful article for dwelling houses, offices, stores, hotels, railroad cars, hospitals, &c., and doing away with the hooks, chains, wedges, bricks, &c., ordinarily used for this purpose. The rubber covering to the roller does no injury to carpets or oil cloths, and by simply lifting the handle the spring can be thrown out of use when desired. If the holders are required to operate against very strong springs or winds, it should be so stated when ordering.
Sise, Gibson & Co.,
AGENTS,
100 Chambers St., New York.

CHATTANOOGA ADVERTISEMENTS.

Soddy Coal Company,

J. T. Williams, Gen'l Man,

MINERS

Wholesale and Retail Dealers in

Soddy and Sale Creek Coal and Coke.

OFFICE: Market Bet. 4th and 5th Sts.

DICKERSON & GUILD,

Civil and Mining Engineers

and Analytical Chemists.

General Engineering Work, Surveys of and Reports on Mines and Mineral Properties, Analyses of Minerals and all Commercial Products. Specialty. Practical Boiler Tests of the comparative Evaporative power of Fuels for Water works and Manufactories.

Office and Laboratory, 8, 10 and 12, Lee Block, corner Ninth and Carter streets, CHATTANOOGA, TENN.

MONTAGUE & CO.,

MANUFACTURERS OF

FIRE BRICK.

Vitrified, Salt-Glazed

SEWER PIPE.

RAILROAD CULVERT PIPE

(DOUBLE STRENGTH).

D. W. HUGHES,

MANUFACTURER OF

YELLOW PINE & POPLAR LUMBER,

SASH, DOORS AND BLINDS,

Branch Yards { Birmingham, Ala. / Knoxville, Tenn. Chatanooga, Tenn.

STONE & EWING,

Steel Rails, R. R. Spikes,

TRACK BOLTS,

Angle Bars, &c.

J. T. CAHILL,

Manufacturer of

IRON AND BRASS CASTINGS,

CRESTING OF ALL KINDS,

Architectural Work and Building Castings a specialty, Marbleized Iron Mantels of all sizes and prices, Grates, Fencing, &c

OFFICE: COR. HOOKE AND BOYCE STS.

☞ Orders from a distance promptly attended to, and satisfaction guaranteed.

WILLINGHAM & CO.,

MANUFACTURERS

SASH, DOORS, BLINDS,

FANCY STAIR WORK, CORNICES,

and all work appertaining to the construction of buildings.

DIXIE POWDER CO.

MANUFACTURERS OF

CRITERION DYNAMITE,

Quality Guaranteed Equal to any made in the United States.

Write for Prices.

Dixie Powder Co.,

CHATTANOOGA, TENN.

C. E. JAMES & CO.,

RAILWAY

Mining and Furnace Supplies.

Tanite Emery Wheels.
Rœbling's Wire Rope,
Hoyt's Leather Belting,
La Belle Steel,

Hercules Dynamite,
Blasting and Rifle POWDER,
Fuse, Fuses and Explodes.

CHATTANOOGA STEAM BOILER WORKS,

Steel and Iron Boilers, Stand Pipes, &c.,

ALFRED WEBB & CO.

ETNA FIRE BRICK COMPANY,

OF OHIO.

LOWE & TUCKER,

General Southern Agents,

CHATTANOOGA, TENNESSEE.

Square, Soap, Split, Arch, Key and Cupola Brick in store, and quotations and freight rates given in car load lots to Blast Furnaces, Rolling Mills, Foundries, &c. These brick also are adapted for Gas Companies, Boiler Settings, Coal Grates and all purposes where a superior quality of Fire Brick are desired.

Walker Iron Co.,

Chattanooga Iron Co.,

MANUFACTURERS OF

SUPERIOR FOUNDRY AND FORGE

PIG IRONS.

L. S. COLYAR,

General Manager.

Chattanooga Foundry and Pipe Works.

D. GILES, Prest. C. B. IBESTER, Vice-Prest.

M. LLEWELLYN, Sec. and Treas.

Successors to D. GILES & CO., Chattanooga, Tenn., Manufacturers o

CAST IRON GAS & WATER PIPE

Also CASTINGS and PATTERNS of every description MADE TO ORDER.

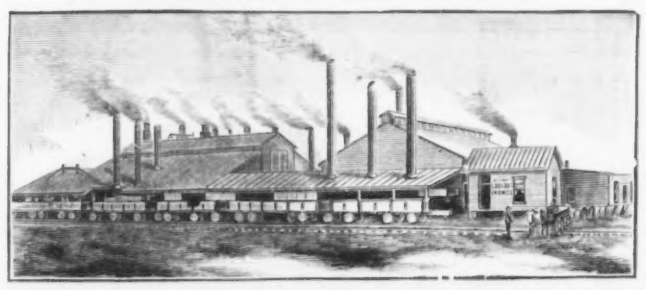
J. N. HAZELHURST, Prest. J. W. THORNTON, Sec.

LOOKOUT IRON CO.,

MANUFACTURERS OF ALL SIZES

MERCHANT BAR IRON.

Fish and Angle Plate.



Light "T" Rail, Round and Square Edge Tire.

AND BUTT-WELDED WROUGHT IRON PIPE, ALL SIZES. 'BOX "G."

S. B. LOWE. A. E. TUCKER.

LOWE & TUCKER,

BROKERS and COMMISSION,

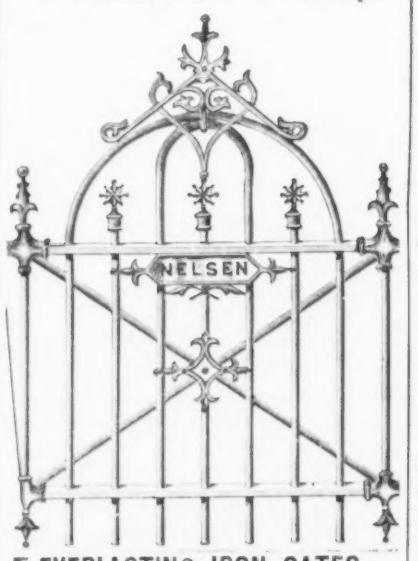
CHATTANOOGA, TENN.,

Southern Agents for

READING IRON WORKS, Wrought Iron Pipe, Plain and Galvanized.
ETNA FIRE BRICK WORKS, for Furnace Boshes, Hearths, Linings, Heating Furnaces, Cupolas, &c.
SAGENDORPH ROOFING AND PAINT CO., Standing Seam, V Crimp and Corrugated Iron Roofing.
DILWORTH, PORTER & CO., Railroad and Boat Spikes.
OLIVER BROS. & PHILLIPS, Track, Bridge and Car Bolts, and Steel Car Links and Pins.

Also dealers in Pig Iron, Foundry Coke, Light Rails, &c.

A Hardware Novelty.



EVERLASTING IRON GATES

For Wood or Stone Posts, for opening 3 to 4 feet, varying by 3 inches. Put up 5 in a crate.

ADDRESS

The VALLEY FORGE & FOUNDRY,

KNOXVILLE, TENN.

Manufacturers of Wrought Iron Fences exclusively.

J. H. WARNER & CO.,

IMPORTERS AND JOBBERS OF

HARDWARE,

MINING AND MANUFACTURING SUPPLIES,

HOWE SCALES, KING'S POWDER, ATLANTIC DYNAMITE,

Market and Seventh Sts., Chattanooga, Tenn.

New York Office: 113 Chambers St.

COOLIDGE & BUCK,

Southern Sole and Direct Representatives of

DETROIT STEEL AND SPRING WORKS,

Steel in all Shapes, Tool, File, Spring, &c.

LIDGERWOOD MFG. CO., HOISTING MACHINERY.

AMERICAN DIAMOND ROCK BORING CO., "DRILLS" FOR PROSPECTING FOR COAL AND IRON.

DETROIT BLOCK WORKS. TACKLE BLOCKS.

VULCAN STEEL WORKS, 56 to 70 lb. STEEL RAIL.

Also of Manufacturers of Sash, Door and Blinds; Wheelbarrows, Iron, Steel and Wood; Rubber Goods; Rail Road and Miners' Supplies.

Etna Coal Co., WHITESIDE, TENN.,

SOLE MINERS OF THE CELEBRATED ETNA BLACKSMITH COAL,

and **SOLE MANUFACTURERS OF ETNA FOUNDRY COKE,**

Also Miners of and Dealers in Coal and Coke for Domestic Purposes.

CITICO FURNACE CO.,

Manufacturers of Superior

Foundry and Forge Pig Iron.

H. S. CHAMBERLAIN, Pres.

ROANE IRON CO.,

Manufacturers of

FOUNDRY AND FORGE PIG IRON,

also Steel Rails from 30 to 60 lbs. to the yard.

H. S. CHAMBERLAIN, Pres.

CHATTANOOGA SAW WORKS,

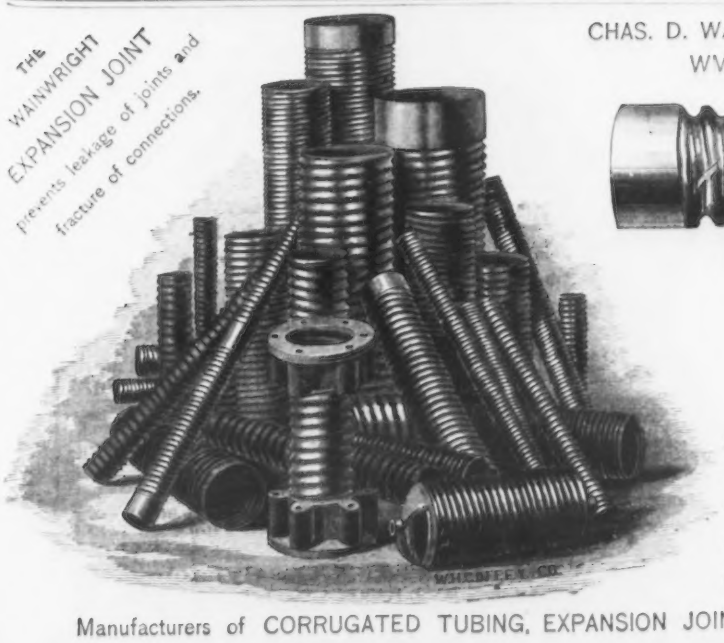
Manufacturers and Dealers in

Saws and Saw Mill Supplies

OF ALL KINDS.

Special attention given to the Repairing of all kinds of saws. Liberal discounts to the hardware trade. Write for prices.

THE WAINWRIGHT EXPANSION JOINT prevents leakage of joints and fracture of connections.



CHAS. D. WAINWRIGHT, President. J. M. BETTON, Sales Manager.

WM. T. ANDREWS, Sec'y and Treas. R. F PRATT, Sup't and Engineer.

THE WAINWRIGHT MAN'F'G CO.

Nos. 65 and 67 Oliver Street, Boston, Mass

No. 93 Liberty Street, New York, N.Y.

FAIRBANKS & CO., { 701 & 703 Arch St., Philadelphia, Pa. / 302 Wood St., Pittsburgh, Pa.

The Wainwright Expansion Joint is constructed of *corrugated copper seamless drawn tubing*, which possesses great *longitudinal flexibility*, and *absorbs the strain* caused by the expansion and contraction. It is fitted at both ends with screw or flanged surfaces, for connection. These Joints are positive, doing away with Stuffing Boxes and packing.

Manufacturers of CORRUGATED TUBING, EXPANSION JOINTS, FEED-WATER HEATERS, CONDENSERS, FILTERS, and RADIATORS.

BABBIT METAL.

ALLEN'S A1 Black Lead Compound

The best for manufacturers of machinery and general purposes.

PRICES VERY LOW.

Try it and you will use no other. Have customers who have bought it regularly for over 20 years. No traveling agents employed. If your dealer does not keep it, order from

W. L. FAY & CO., Sole Manufacturers,

ELYRIA, OHIO.

JEFFERSON IRON WORKS,

Steubenville, Ohio,

MANUFACTURERS OF

JEFFERSON STEEL NAILS

WITH NATURAL GAS FUEL.

LAG SCREWS

BLANK BOLTS

BOLTS OF ALL KINDS FOR RAILROADS, BRIDGE BUILDERS,

AMERICAN-BOLT-CO
MANUFACTURERS
LOWELL MASS

COTTON AND WOOLEN MILLS AND MACHINERY MANUFACTURERS.

COLD PUNCHED SQUARE AND HEXAGON NUTS

WASHERS OF ALL KINDS

PORT CHESTER BOLT & NUT CO.,
PORT CHESTER, N. Y.,

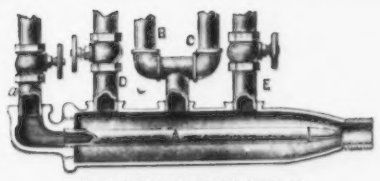
MANUFACTURERS OF

BOLTS, NUTS,
RIVETS AND WASHERS,

CHAMFERED AND TRIMMED. SQUARE AND HEXAGON NUTS A SPECIALTY.

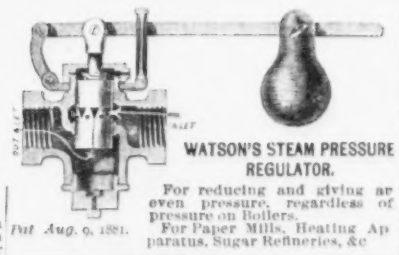
J. FRED. WILSON.
MANUFACTURER OF
Cold Punched, Square and Hexagon Nuts, Washers, Chain Links, &c.
Die Making and Special Punching to Order.
23 HERMON STREET, - WORCESTER, MASS.

THESE TWO CUTS REPRESENT EXTREME SIZES OF
Bushnell Patent Made Norway Iron Staples,
Especially adapted to Agricultural Implement and Wagon Makers
NEW HAVEN (CONN.) STAPLE WORKS.

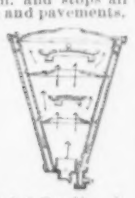


McDANIEL'S SUCTION FITTING,
Pat. Jan. 27, 1885,
Will stop all snapping and cracking noises in steam pipes; increases heat in dry rooms. The only Fitting in the world that will do it. It is worked by steam after passing through the heaters.

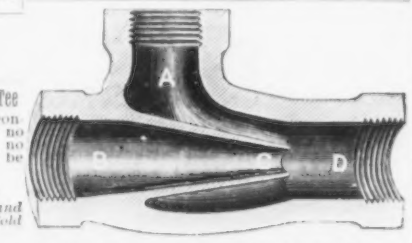
McDANIEL'S PATENT EXHAUST-PIPE HEAD
acts as a muffler, preventing noise of exhaust steam, and stops all spattering of water on roofs and pavements.



Pat Aug. 9, 1881.
WATSON'S STEAM PRESSURE REGULATOR.
For reducing and giving an even pressure, regardless of pressure on Boilers.
For Paper Mills, Heating Apparatus, Sugar Refineries, &c



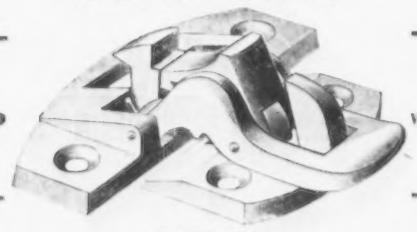
McDaniel's Patent Suction Tee
will make all bad steam connections work perfectly; no backing up on one another; no noise; all radiators should be connected with it.
Price, $1 per inch.
All the above sent on trial and satisfaction guaranteed. Sold by the trade generally.



WATSON & McDANIEL, 144 N. 7th Street, PHILADELPHIA.

DAVIS'
Automatic Sash Fast.
Patented November 24, 1885.

WINDOW ALWAYS LOCKED WHEN SHUT.



It Will Lock Itself. When an Ordinary Fast WOULD NOT WORK AT ALL.

MADE BY
BARNES MFG. CO.
SISE, GIBSON & CO., Agents, New York.

Hurd Patent Respirator.

A sure protection for the Throat and Lungs from Dust, Poisonous Gases and all other impurities.
It is especially adapted for workmen in White Lead Corroding Works, Glass and Blast Furnaces, Chemical Pulverizing, Paint and Color Works, Smelting and Refining Works, Wood-working Establishments, Paper Mills, &c. Send for Descriptive Circular B. Price, $2.00 each. Special discount to the trade.

Morley Respirator Co.,
East Saginaw, Mich.

NON-CORROSIVE PRIMING AND FINISHING PAINT

For Engines, Machinery, &c.
This paint being entirely free from acid will not corrode or rust the iron.
PATENT IRON FILLING,
A composition or filling for Tools, Machinery, Engines, Locomotives, Tenders, Iron Ships, and all iron work for buildings, inside or out. Send for sample card, price list and testimonials. FELTON, RAU & SIBLEY, Nos. 136, 138 and 140 North 4th St., Philadelphia.

PHIPPS & BURMAN'S
PATENTED IMPROVED
CLIPPERS
With Anti-Frictional ROLLER BEARINGS.

For Horsemen and Barbers. Write for our New Catalogue and Prices.
JESSE LEE & SONS,
Sole Agents for PHIPPS & BURMAN,
37 South Fourth Street, Philadelphia.

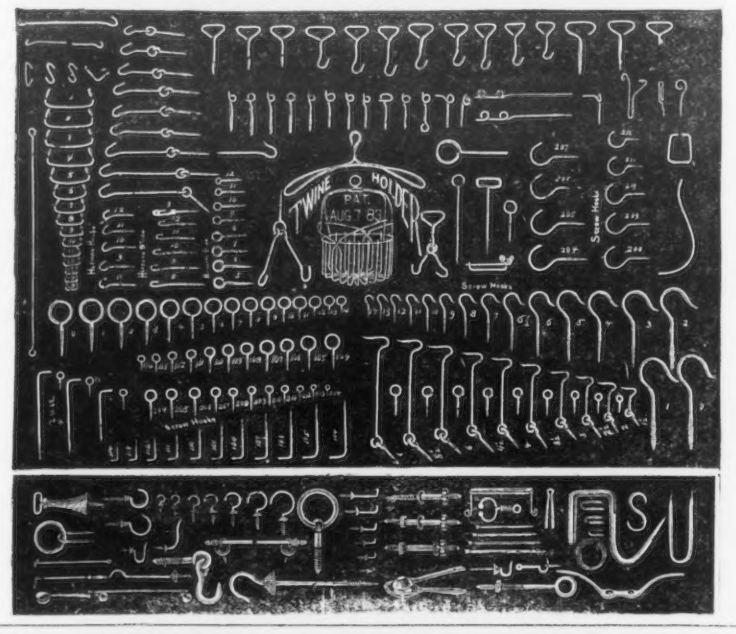
"ENGLISH TROUSERS' STRETCHER"
Green, Cadbury & Co., Patentees and Manufrs, Eng.
Its use makes Old Trousers appear new.

NO MORE BAGGY KNEES
Price $1.75, $5.00 for 3 pairs.
By mail 2.00, 5.50 for 3 pairs.
E. O. THOMPSON, 1338 Chestnut St., Philada. 245 Broadway, N. Y.
WHOLESALE DEPOT:
J. C. McCARTY & CO. 97 Chambers Street NEW YORK.
Trade List and Circulars on application.

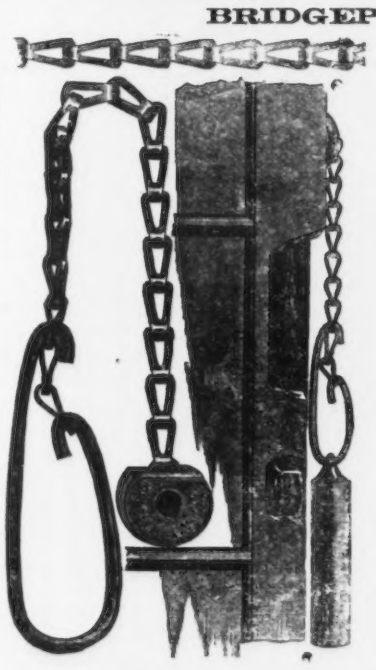
"REGULAR GAUGE" for
FLOURING MILLS, GRAIN ELEVATORS, &c.
"Extra Heavy" for handling Ores, Coal, Broken Stone, &c,
Send for illustrated price list.
W. J. CLARK & CO., Sole Manufrs., SALEM, OHIO.

THE WIRE GOODS CO
A. W. Parmelee, President.
WORCESTER, MASS.
All kinds of Bright and Brass
Wire Goods, Steel Wire Nails and Small Hardware.

Wires Cut, Bent, Headed, Pointed, Threaded and made to any desired shapes. Hand Rail Screws, Cup Hooks, Cary Wardrobe Hooks, Towel Racks and Splasher Holders, Wire Clothes Lines, Staples, Belt Hooks. Special articles made to order.



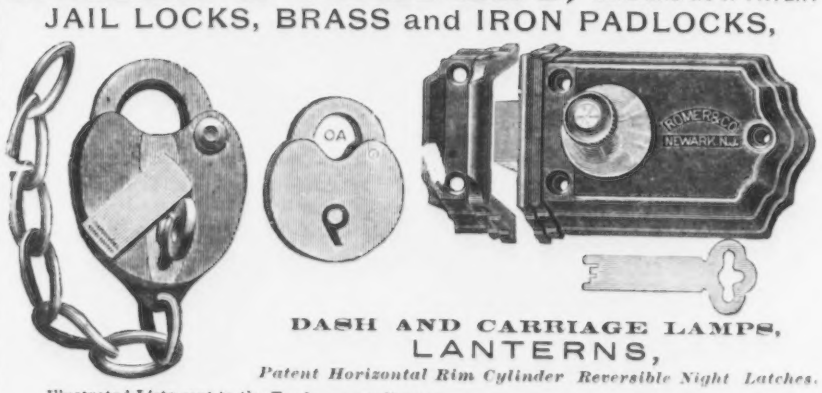
THE SMITH & EGGE MFG. CO.,
BRIDGEPORT, CONN.



THE GIANT PAD LOCK.
Centennial Award. "Superior in Every Respect.
This is one of the best selling locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited.

THE GIANT METAL SASH CHAIN
is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain. Trade-Mark Registered April 16, 1878, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."

ROMER & COMPANY, Manufacturers of PATENT
JAIL LOCKS, BRASS and IRON PADLOCKS,



DASH AND CARRIAGE LAMPS,
LANTERNS,
Patent Horizontal Rim Cylinder Reversible Night Latches.
Illustrated Lists sent to the Trade on application.
8-42 Summer Ave., near D., L. & W. R. R. Depot, Newark, N. J.

THE SYRACUSE TWIST DRILL BIT. (For Wood.)

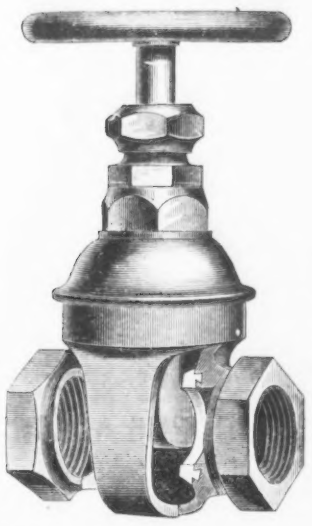
This tool is designed to meet the needs of CARRIAGE and CABINET MAKERS. It is also specially adapted to REPAIR WORK, and is THE BEST FARMERS' BIT in the market.
1. It is made of the BEST STEEL.
2. It is ACCURATE IN SIZE.
3. It can be FURNISHED BY 64ths of an inch if desired.
4. It can be SHARPENED ON A GRINDSTONE.
5. It WILL NOT SPLIT THE WOOD.
6. It will CUT OFF NAILS.
7. It will make a STRAIGHT HOLE.
8. It will REAM OUT A HOLE.
MANUFACTURED BY
SYRACUSE TWIST DRILL CO., Syracuse, N. Y.
Agents: H. H. & C. L. MUNGER, Chicago, Ill. A. FLAGLER & CO., 72 Reade St., New York. CHAS. S. DAVIS, 114 South Sixth St., Philadelphia, Pa.

PIG IRON,
BAR IRON,
BAR STEEL,
STEEL BLOOMS,
STEEL BILLETS.

RIVERSIDE IRON WORKS,
MANUFACTURERS OF
RIVERSIDE STEEL NAILS.
WHEELING, WEST VIRGINIA

SMALL T RAILS.
FLAT RAILS
OF IRON OR STEEL.
FISH BARS
OF IRON OR STEEL.

CHAPMAN VALVE MANUFACTURING COMPANY,



MANUFACTURERS OF

Valves and Gates

FOR

STEAM, WATER, GAS, AMMONIA.

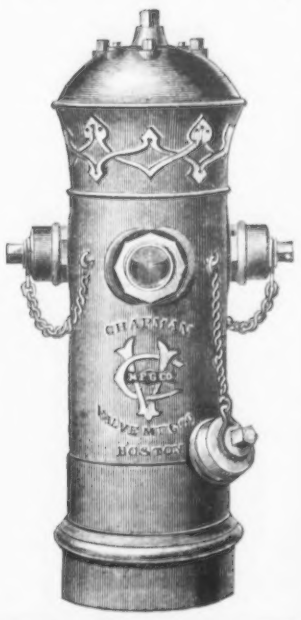
GATE FIRE HYDRANTS,

With and Without Independent Nozzle Valves.

Valves and Hydrants made with Babbitt Metal Seats and non-corrosive working parts.

ALL WORK GUARANTEED.

Send for Price List.

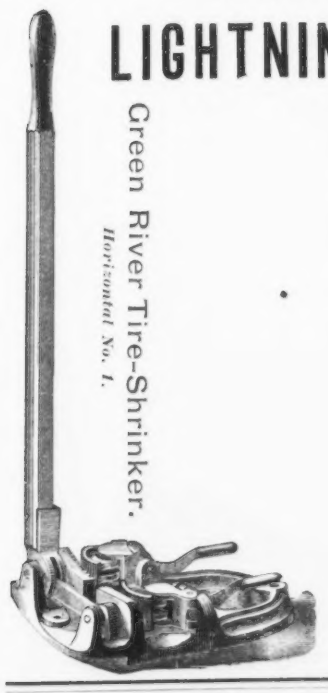


Works and General Office:
INDIAN ORCHARD, MASS.

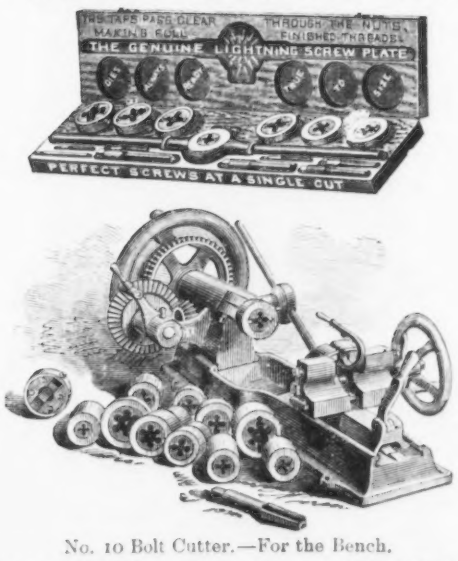
Treasurer's Office:
72 Kilby and 112 Milk Sts., BOSTON, MASS.

WILEY & RUSSELL MFG. CO., Greenfield, Mass.,
MANUFACTURERS OF THE

LIGHTNING AND "GREEN RIVER" LABOR-SAVING TOOLS.

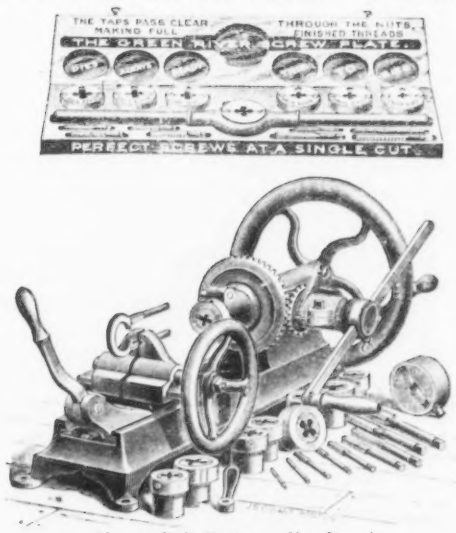


Green River Tire-Shrinker.
Horizontal No. 1.



No. 10 Bolt Cutter.—For the Bench.

SEND FOR THE NEW PRICE LIST.



No. 20 Bolt Cutter.—For Bench.

NEW GREEN RIVER
Upright Tire-Shrinker,
IMPROVED.

No. 0.—For Tires ⅜ x 2 inch.
No. 2.—For Tires 1 x 4 inch.

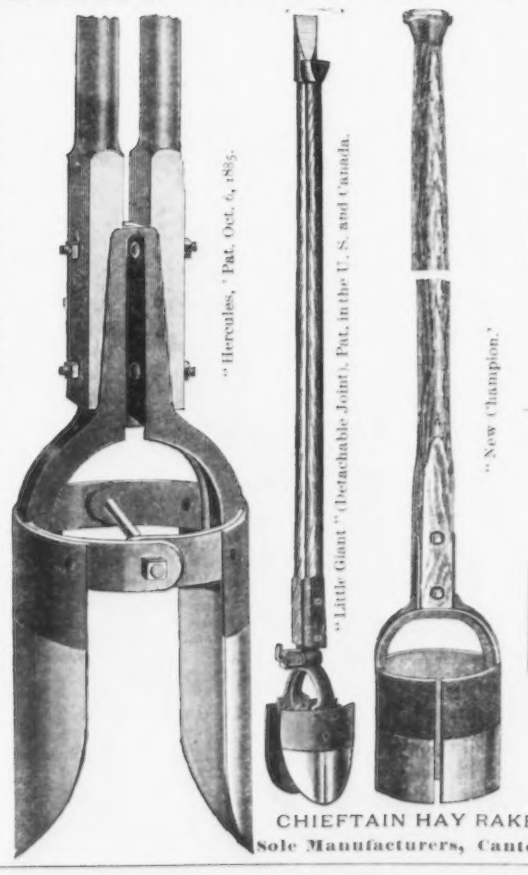
European Agents---**Messrs. SELIG, SONNENTHAL & CO., London.**

TO THE TRADE.

Please remember our line of manufacture. We are *Headquarters* for *Hand and Wheel Dump Sulky Rakes, Hay Tedders, Hay Forks, Little Giant, Hercules and New Champion Post Hole Diggers, Portable Tree Protectors,* and *Automatic Extension Step Ladders. Our Goods are not equalled* by any on the market.

KOHLER'S POST HOLE DIGGERS.

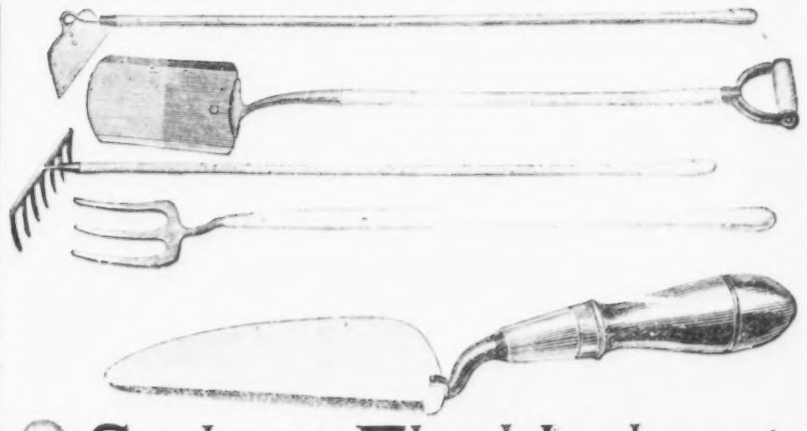
CHIEFTAIN HAY RAKE CO., Canton, Ohio.



ROBERT C. REEVES,
185 Water St., New York Agent.

WM. PICKETT & SON,
161 Lake Street, Chicago Agents.

CHIEFTAIN HAY RAKE CO.,
Sole Manufacturers, Canton, Ohio



Garden & Floral Implements

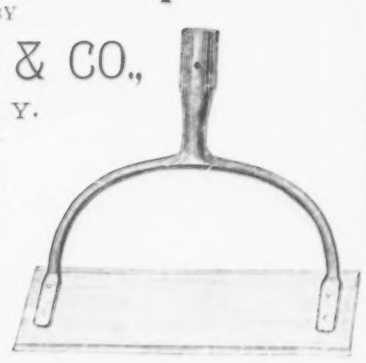
MANUFACTURED BY

C. W. DUNLAP & CO.,
BROOKLYN, N. Y.

We make a larger variety of these goods than any other manufacturer in the United States.

All Goods Made to a Standard.

Illustrated Catalogue furnished purchasers.



SOLID SPOUT
MINERS LAMP.

HUNT & CONNELL LIMITED SCRANTON PA

MALIN & CO., 45 Viaduct St., Cleveland, Ohio,
Dealers in Steel, Copper, Brass, Tin Plated and Copper Plated Wire.
Manufacturers of BESSEMER STEEL WASHERS.

PATENT SPOOL WIRE FOR THE RETAIL HARDWARE TRADE.

Dealers who handle it do away with the BROKEN BUNDLE BUSINESS and sell small quantities by the spool only. It is a convenience for both dealer and consumer. It is SHELLAC COATED and CANNOT RUST; is wound like spool cotton on QUARTER POUND, HALF POUND and ONE POUND Spools, one dozen spools in a box.

SEND FOR ILLUSTRATED PRICE LIST.
SPECIAL WIRES FOR MANUFACTURING PURPOSES ON ANY SIZE OF SPOOL.

Sold by all Hardware Jobbers.

New York Office,
G. T. MOORE, 103 Chambers Street.

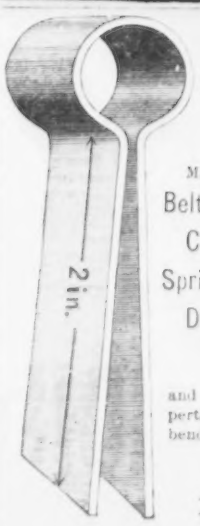
Boston Office,
JNO. WALES & CO., 5 Winthrop Sqr.

IRON LEVELS.

Sliding Nut Calipers.

Screw with Sliding Nut easily attached to old Calipers or Dividers.

C. F. RICHARDSON, Athol, Mass.



BROWNING, SISUM & CO.,
85 Chambers St.,

Manufacture
Belt Hooks
Cotters,
Spring Keys,
D Rings,
Staples,
and everything pertaining to wire bending.

FACTORY,
BROOKLYN.

"PENNSYLVANIA."

BEWARE OF IMITATIONS.

The great and unprecedented success of the PENNSYLVANIA LAWN MOWER has induced manufacturers of other Lawn Mowers to imitate our open cylinder. Not being able to use the Patents upon which our knives are formed, they all make a bungling attempt to try and accomplish the same result, in trying to secure the same cutting edge on the knives by a different shaped edge which after being in use a short time, reduces the edge of the knife to cause great friction, and without securing the desired results.

1887.

PENNSYLVANIA LAWN MOWER.

Has No Equal,

Surpassing All Others.

AND PRONOUNCED

"THE BEST."

Illustrated Price Lists sent upon application.

LLOYD & SUPPLEE HARDWARE CO., Phila.
J. C. McCARTY & CO., New York.
AMES PLOW CO., Boston, Mass.
SIMMONS HARDWARE CO., St. Louis, Mo.
HAMILTON & MATHEWS, Rochester, N. Y.
MARKLEY, ALLING & CO., Chicago, Ill.
LOGAN, GREGG & CO., Pittsburgh, Pa.
JANNEY, SEMPLE & CO., Minneapolis, Minn.
FOSTER, STEVENS & CO., Grand Rapids, Mich.
GEO. TRUTCH HDW. CO., Denver, Col.
MOORHOUSE, WELLS & CO., Decatur, Ill.
A. E. BONESTEEL, Troy, N. Y.
WALBRIDGE & CO., Buffalo, N. Y.
CLARK, QUIEN & MORSE, Peoria, Ill.
HALL & WILLIS HARDWARE CO., Kansas City, Mo.
SICKELS, PRESTON & CO., Davenport, Iowa.
M. MITHOFF & CO., Columbus, Ohio.
KRUSE & BAHLMANN, Cincinnati, Ohio.
JOHNSON BROS., Cincinnati, Ohio.
BUHL, SONS & CO., Detroit, Mich.
LAYMAN, CAREY & CO., Indianapolis, Ind.
LOCKWOOD, TAYLOR & CO., Cleveland, Ohio.
WM. FRANKFURTH & CO., Milwaukee, Wis.
THE TODD-DONIGAN IRON CO., Louisville, Ky.
R. A. BREAKEY, Los Angeles, Cal.
PERRIN HDW. CO., La Fayette, Ind.
BURHANS BLACK & CO., Syracuse, N. Y.
MILTON, ROGERS & CO., Omaha, Neb.

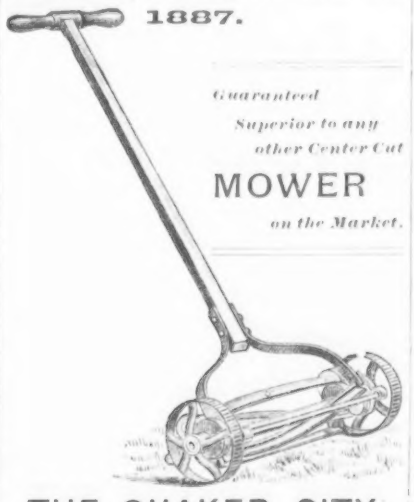
"QUAKER CITY."

The trade will soon find an ordinary and roughly-made Reel of blades and stationary knife is not all that is required to make a perfect Lawn Mower.

THE

QUAKER CITY LAWN MOWER.

1887.



Guaranteed Superior to any other Center Cut

MOWER

on the Market.

THE QUAKER CITY,

Reduced in Price.

NOW WHY BUY A WORTHLESS MOWER?

Send for Circular.

LLOYD & SUPPLEE HDW. CO., Philadelphia.
J. C. McCARTY & CO., New York.

"CONTINENTAL."

DOUBLE GEAR.

The Cylinder Knives are solid cast steel, made by a patented process; are hardened and tempered in oil, self-sharpening, and never require a file or stone after leaving the factory. All the bearings are long, so that the wear on the Mower will be slow, and oil seldom required. It is made to run at high speed, and will not only cut higher grass, but laeves the lawn perfectly smooth.

Continental Lawn Mower.

1887.

LIGHTEST RUNNING
—AND—
SWIFTEST CUTTING.

Cutting Bar in the rear adapting itself to all unevenness of the ground.

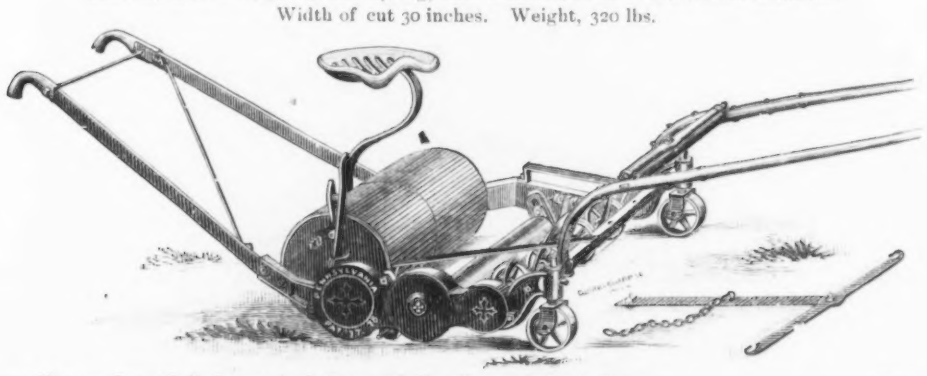
CONTINENTAL LAWN MOWER CO., PHILADELPHIA.

Illustrated Price Lists sent upon Application.

J. C. McCARTY & CO., New York.
A. F. SEEBERGER & CO., Chicago.
C. W. FAIRMAN, Kansas City, Mo.
C. VONNEGUT, Indianapolis, Ind.
WOLFF, LANE & CO., Pittsburgh, Pa.
GEO. WORTHINGTON & CO., Cleveland, Ohio.
DUNHAM, CARRIGAN & CO., San Francisco, Cal.
BIGELOW & DOWSE Boston, Mass.
STEELE & AVERY, Rochester, N. Y.
ISAAC WALKER HDW. CO., Peoria, Ill.
WEED & CO., Buffalo, N. Y.
W. J. KINSEY IMPLEMENT CO., Denver, Col.
HIMEBAUGH & TAYLOR, Omaha, Neb.
STANDARD SUPPLY CO., Kansas City, Mo.

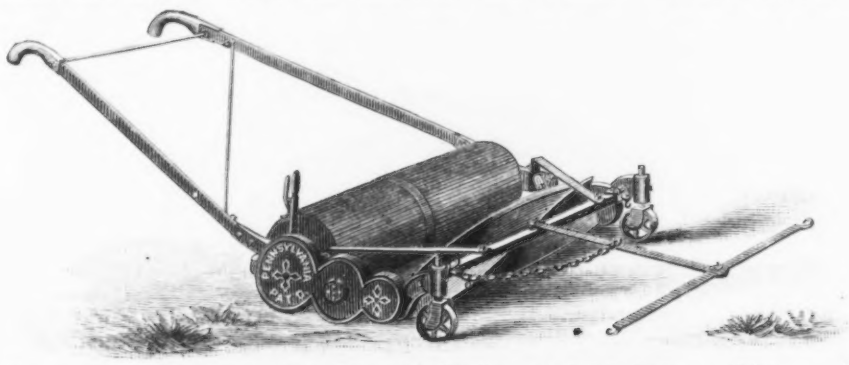
PENNSYLVANIA HORSE LAWN MOWER.—Open Cylinder.

Showing Mower with Seat and Spring, Shafts and Handles. Draft Irons Detached.
Width of cut 30 inches. Weight, 320 lbs.



Horse Mower, Open Cylinder, 30 inch Cut, with Handles and Draft Irons, - - - $110.00
Extra for Seat, Spring and Foot Board, - $8.00 | Extra for Shafts, - $7.00
recommend the Mower with Draft Irons only. Discount on Horse Mowers not same as on Hand Mowers.

PENNSYLVANIA HORSE LAWN MOWER.—Closed Cylinder.

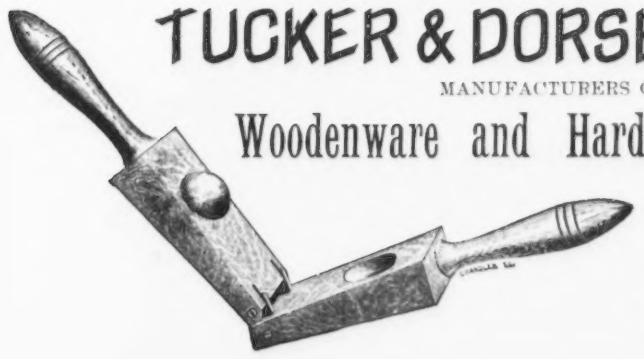


Horse Mower, Closed Cylinder, 30 inch Cut, with Handles and Draft Irons. Price, $100.00
Extra for Seat, Spring and Foot Board, - $8.00
Extra for Shafts, - - - - - - - - - 7.00
☞ Discount on Horse Mowers is not same as on Hand Mowers.

TUCKER & DORSEY MFG. CO., INDIANAPOLIS, U. S. A.

MANUFACTURERS OF

Woodenware and Hardware Specialties.



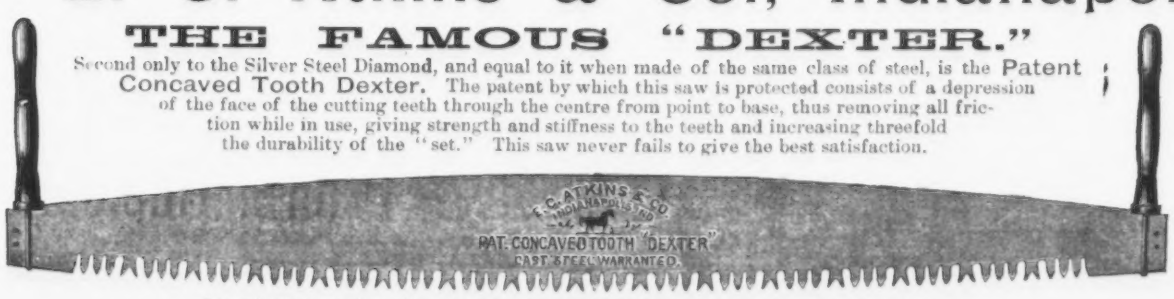
Write for Special Discounts to Jobbers and notice next issue.

E. C. Atkins & Co., Indianapolis, Indiana.

ATKINS ALWAYS AHEAD. E. C. ATKINS & CO. INDIANAPOLIS, IND. TRADE MARK

THE FAMOUS "DEXTER."

Second only to the Silver Steel Diamond, and equal to it when made of the same class of steel, is the Patent Concaved Tooth Dexter. The patent by which this saw is protected consists of a depression of the face of the cutting teeth through the centre from point to base, thus removing all friction while in use, giving strength and stiffness to the teeth and increasing threefold the durability of the "set." This saw never fails to give the best satisfaction.



Ground substantially uniform gauge on the toothed edge, and any gauge required on the back.

ATKINS'
Cross-Cut, Circular, Band and Gang
SAWS
Are Everywhere Recognized as the
'Standard of Excellence.

WESTERN AGENCY FOR
Tanite Emery Wheels.

Gray Iron and Brass Castings.

To those who are in the market for Castings:

We should be pleased to have you send us drawings, cuts or sketches, or *preferably samples* of the castings you are using and allow us to quote you our prices. It would be still better to forward *patterns* with a small trial order on which we will agree to make a satisfactory price. We are confident of our ability to produce castings of the finest quality known to the trade at reasonable prices. We use only the best obtainable materials and approved modern appliances. We employ only steady and intelligent skilled workmen, paying them good wages. While this may make our castings cost more per pound than those of cheap material and poor workmanship, we will guarantee ours to be much less expensive to the user in the end, because of their proper weight and the time and labor saved in the drilling, planing, turning, filing or other finishing. We prefer the reputation of being a high-priced house which does only the very best work to the name of a cheap producer of rough, hard and low-priced castings, out of shape or of heavier weight than the patterns call for. It is astonishing to notice how much extra weight can be (*and often is*) added to a casting by a careless, incompetent molder, rushing out piece work at starvation wages! This is generally overlooked by buyers of cheap (?) castings.

We have lately had the unsolicited testimony from a customer in London, to whom we had shipped some light iron castings, that his workmen were able to finish our castings in *one-third* the time they required to do the same work on castings from similar patterns made in England!

We have facilities for wood and metal pattern making, drilling, polishing, plating, japanning and the manufacture of hardware and light machines by contract.

Machinery Castings, Light or Heavy. Low Prices on Large Contracts.

Freight paid to principal points in New England and New York. *Correspondence Solicited.*

SPRINGFIELD FOUNDRY CO., 93 Liberty St., Springfield, Mass.

Boston Office, 141 A Milk St. - - H. P. LIVERMORE, Agent.

— THE —

ILLINOIS WIRE NAIL CO., CHICAGO,

MANUFACTURERS,
224 and 226 No. Union St.

Manhattan Leather Works,

298 Broadway, New York.

Day's Self-Heating Bath Tub,

HEATED BY GAS, GASOLINE OR KEROSENE.
Manufactured by
THE DAY MANUFACTURING CO., - Detroit, Mich.
Send for Descriptive Circular.

O. W. BULLOCK, SPRINGFIELD, MASS.

Manufactures nearly *ONE THOUSAND* styles, sizes and varieties of

Extra Fine, Warranted Hand and Bench Tools,

for Watch, Clock, Piano and Cabinet Makers, Jewelers, Printers, Electrotypers, Dentists, Amateurs, Carpenters, Builders, Machinists and almost every kind of Mechanic or Artisan. Give *American* Mechanics a chance to buy *American*, instead of *Foreign* Tools.

Send for New Illustrated Catalogue and Price List.

THE "BUCKEYE" JUNIOR LAWN MOWER

The Lightest Running, Most Durable and Far Surpassing all other Machines made

10, 12, 14 and 16 inch cut.

MANUFACTURED BY
MAST FOOS & CO.
SPRINGFIELD, O.

ALSO MANUFACTURERS OF THE

Buckeye Hose Reel and Lawn Sprinkler, Buckeye Wrought Iron Fencing, Buckeye Force Pump,

—AND—

Iron Turbine Wind Engines

SEND FOR CIRCULAR AND PRICE LIST.

THE NEW EASY LAWN MOWER.

The leading mower in the market.
Front Cut. Steel. Open Roller Traction. Easy and Noiseless in Operation

The only mower that will cut *Wet Grass, Narrow Borders*, and close to walls and fences. Warranted in every particular.

Manufactured by BLAIR MFG. CO., Springfield, Mass.

Medium Size "NEW EASY."

LAWN MOWER.

The New Model

Our Latest & Best MOWER.

Send for Circular & Price List.

For Simplicity, durability, and quality of work it is unequalled, while for Lightness of draft it excels, by a large per centage, any other Lawn Mower made.

CHADBORN & COLDWELL MANUF'G CO.
NEWBURGH, N. Y.

The T. H. Bullock, BELLOWS The Best for the Money. FORGES

CLEVELAND, OHIO.

Springfield Glue and Emery Wheel Co.,

SPRINGFIELD, MASS.,
Patentees and Manufacturers of
EMERY WHEELS,
EMERY WHEEL MACHINERY
AND
Flint Paper.

WATER PREVENTS HEATING THE WORK.

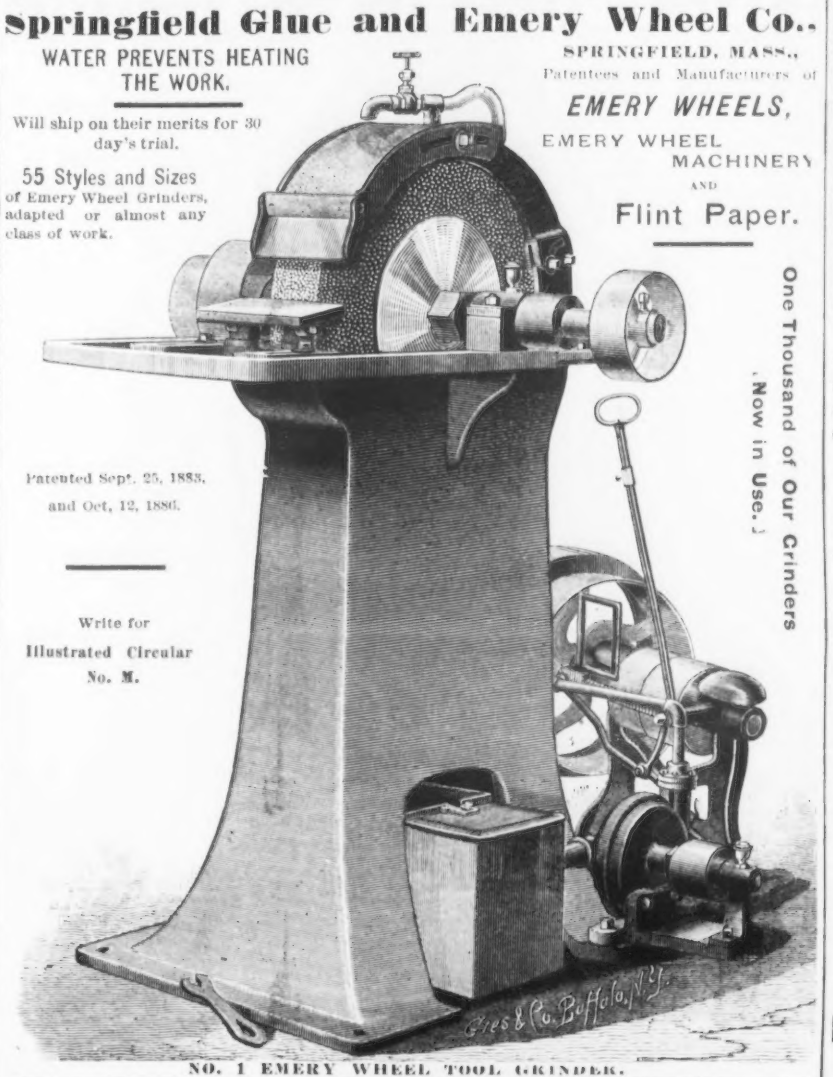
Will ship on their merits for 30 day's trial.

55 Styles and Sizes of Emery Wheel Grinders, adapted or almost any class of work.

Patented Sept. 25, 1883, and Oct. 12, 1886.

Write for Illustrated Circular No. M.

One Thousand of Our Grinders Now in Use.

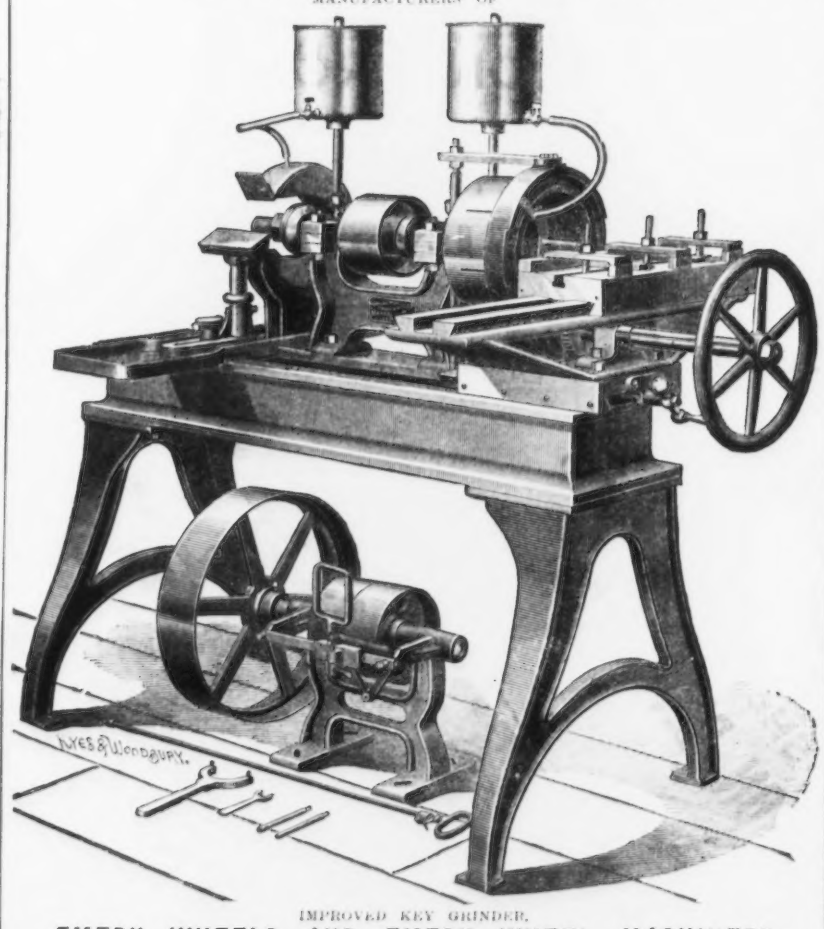


NO. 1 EMERY WHEEL TOOL GRINDER.

ESTABLISHED 1867. CAPITAL $100,000.

Northampton Emery Wheel Co.,

LEEDS, MASS., and 20 So. Canal St., CHICAGO.
MANUFACTURERS OF



IMPROVED KEY GRINDER.

EMERY WHEELS AND EMERY WHEEL MACHINERY
OF BEST QUALITY.

Send for Catalogue. FACTORY AT LEEDS MASS.

FORSTER'S STONE AND IRON ORE BREAKER

VERY SIMPLE AND VERY DURABLE.

For Mining, Blast Furnaces, Iron and Steel Works, Railroad Ballast, and Macadam.

Patented April, 1873.

Lever moves horizontally. Can be operated with horse, mule, water or steam power. Owing to **Great Gain in Leverage**, we do the work of other Crushers with **one third the power** and one half the weight; and as we crush twice in a revolution, where other Crushers act but once, **we do double the quantity.** In Fine Crushing for Stamps, Burrs, or Finishing Mills, we can do more and **Finer Work** than has ever been attempted. For prices and testimonials, address

View when Ready for Work.

TOTTEN & CO. Rolling Mill and Heavy Machinery Founders. PITTSBURGH, PA.

THE MAUD S. CURRY COMB

is no more an experiment. Its merits are proven by last season's sales in the United States, Canada and England. It is well made and finished. It has good malleable frames, heavy, well cut bars, steel wire, fine polished handle, and is the only two faced comb on the market. It outsells all other combs where introduced. For sale by the principal jobbers.

AYRES & DECKER MFG. CO.,
SOLE MANUFACTURERS,
KEOKUK - - - IOWA.

BROWNE'S UNIVERSAL FLEXIBLE WEATHER & DUST STRIP.

"THE BEST." ANY ONE CAN APPLY IT.

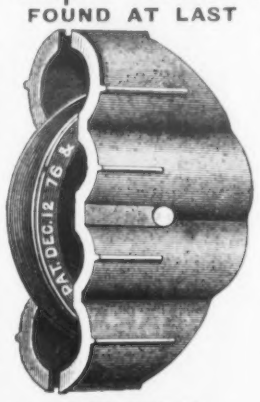
Has been on the market for nine years, is sold by Hardware Dealers all over the United States, and acknowledged to be the *best and neatest*. Excellent shelf goods. Send for samples and discounts.

COURTENAY & TRULL,
15 Dey St., New York

The Empire Sash Pulley.

FOUND AT LAST

THE BEST AND THE CHEAPEST.
Great Saving of Time and Material.

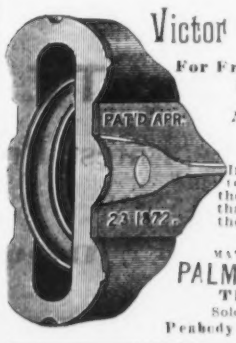


All with ¼ inch Steel Axles. These pulleys can be fitted to the window frames at the rate of 60 per hour. No chisels used. No screws required. It is more durable and makes a better finish than any other PULLEY in the world.

MANUFACTURED BY
EMPIRE PORTABLE FORGE CO.,
COHOES, N. Y.,
Manufacturers of the largest and best line of
Portable Forges and Hand Blowers
FOR SALE EVERYWHERE.

THE
Victor Frame Pulley

For Frames for Thin Sashes.



No Chisels, No Screws, Cuts its own mortise, insuring a perfect fit.

Impossible for the cord to run off. Applied to the frame in less time than it takes to describe the operation.

MANUFACTURED BY
PALMER MFG. CO.,
TROY, N. Y.
Sole Eastern Agent
Peabody & Parks, Troy, N. Y.

THE PERFECT DOOR SPRING

Cheap, Simple, Durable, Effective.
FOR LIGHT AND HEAVY DOORS.
Indorsed by the Trade.

Made in four sizes of the best Crucible Steel Wire. The smaller sizes have no equal for screen and other light doors.

COILED WIRE BELTING CO., 93 Cliff St., New York

The Reiher Improved "CHAMPION" —Self-Locking— TRANSOM LIFTER

F. A. REIHER,
Manufacturer,
11-13 S. Canal St., CHICAGO.

A represents the stationary guiding and locking bar which receives the operating rod C.—B forms with arm E & bracket F the connection with the transom. D is the adjustable guide to hold the guiding & operating rod to the door casing. Handle G in combination with parts A & C forms a novel locking device and will hold the transom in any desired position no matter how the transom may be hinged.

We also manufacture several other devices. Send for catalogue and price list.

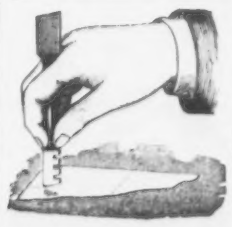
KEITH & TRUFANT

MANUFACTURERS OF WIRE NAILS & CAMPELLO & WIRE TACKS OF EVERY DESCRIPTION. MASS.

PATENT EYE

SASH WEIGHT.

W. A. ROSS & BRO., 56 Pine St., City.



MONCE'S
Novelty Glass Cutters
are the standard.
No. 17 Just Out.
Send for Illustrations and Prices.
We also make the Compartment Foot Interchangeable Lock Stencils that are having such a run.
S. G. Monce,
BRISTOL, CONN.

A NEW DEPARTURE!

THE SMITH & WESSON HAMMERLESS, SAFETY

REVOLVER

Provided with Automatic Shell Extractor, Rebounding Lock.

Calibres 32 and 44

IN

PREPARATION.

Calibre 38,

Weight 18½ oz.

NOW READY.

ABSOLUTE PROTECTION FROM ACCIDENTAL DISCHARGE INSURED.

The Latest Production from the Works of SMITH & WESSON, Springfield, Mass., Manufacturers of Superior Revolvers, both Double and Single Action.

Superiority in Every Point Universally Conceded.

SEND FOR DESCRIPTIVE CIRCULAR.

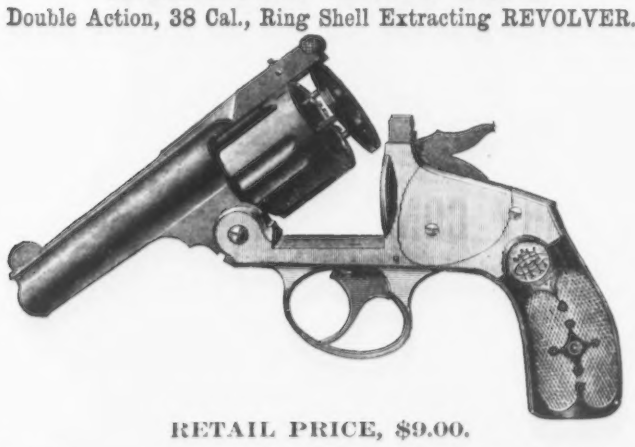
Productions of the American Arms Co., Boston, Mass., U. S. A.

AMERICAN ARMS CO.'S
(S. & W. Model.)
NEW AUTOMATIC, SHELL EJECTING,
DOUBLE ACTION REVOLVER.

Retail Price, $10.00.

The Latest and Best
IN THE MARKET.
32 AND 38 CAL., C. F.
Using the S. & W. Central Fire Cartridges.

AMERICAN ARMS CO.'S
Double Action, 38 Cal., Ring Shell Extracting REVOLVER.



RETAIL PRICE, $9.00.

Superior to any shell extracting revolver in the market (not automatic.)

AMERICAN ARMS CO.'S
SINGLE ACTION, 38 Cal., Ring Shell Extracting REVOLVER.

Retail Price, $7.50.

Superior to any shell extracting revolver in the market (not automatic.)

SEMI-HAMMERLESS, SINGLE BREECH-LOADING
SHOT GUN.

Retail Prices. { Twist Barrel, 12 bore, $15.00.
" " 10 " 18.00.

All goods manufactured by us are made of the very best material. The workmanship is first-class. For beauty of finish and elegance of model they have no equal.

ALL OUR GOODS WARRANTED IN EVERY RESPECT.

For Sale by all the leading Gun and Hardware Houses in the United States and Canada.

PHILADELPHIA.

Lloyd & Supplee Hardware Co.
Terms, 30 days. For 60 or 90 days, interest added at 8 per cent. per annum.

Anvils.
Peter Wright's, ₩ ℔ ... 9½@9¾¢
Trenton ... 9¼¢
Eagle Anvils, American, 10¢ ... dis. 20 @ 20&5 ⅌

Axes.
Hunt's Kentucky and Yankee, ₩ doz. net ... $7.25
William Mann, ₩ doz. net ... @ 7.25
Favorite ₩ doz. net ... 6.25
Beveled Axes ... add 50¢
Double Bit Axes, net ... $12.00 @ 13.00
Loveland Axes ... 7.00

Augers and Auger Bits.—New List January 7, 1880.
Snell's Augers and Bits ... dis. 60@60&5 ⅌
New Haven Copper Company ... dis. 60&10 ⅌
Benjamin Pierce Auger Bits ... dis. 40 ⅌
Jennings' Auger Bits, new list Jan. 1, 1884 .dis.. 25 ⅌
Cook's Auger Bits and Augers ... dis 55 ⅌
Snell's Ship Augers ... dis 15 @ 20 ⅌
Watrous' Ship Augers ... dis 15 @ 20 ⅌
Bonney's Pat. Hol. Augers, list $48 ₩ doz dis ... 40&10 ⅌
Stearns Pat. Hol. Augers, list $48 ₩ doz ... dis 20&10 ⅌

Balances.
Light and Common ... dis. 50 ⅌

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells dis. 75@75&10 ⅌
Swiss Pattern Hand Bells ... 60 ⅌
Connell's Door Bells ... dis. 20&10 ⅌
Gt. Western & Kentucky Cow, new list. dis. 70@70&10 ⅌

Boring Machines
Upright, without Augers ... List, $5.50 } ... dis. 50 ⅌
Angular, without Augers ... List, 6.75 }

Bolts.—Eastern Carriage Bolts, new list, June 10 1884 ... dis 70&10 ⅌
Phila. Carriage Bolts new list..dis 75&10@75&10&5 ⅌
Stanley, Wrought Shutter ... dis. 60&10 ⅌

Braces.—Barber's Improved ... dis 50 ⅌
Barber's Old Style ... 50&10 ⅌
Backus, Polished ... dis 60&10@60&10&5 ⅌
Backus, Nickeled ... dis. 60@60&10 ⅌
Spofford ... dis 50&5@50&10 ⅌
American Ball ... dis. 55&10 ⅌
Amidon Improved ... dis. 60@60&10&5 ⅌
Amidon Corner Brace ... dis. 40@40&10 ⅌

Butts.
Cast Fast Joint, Narrow ... dis 60&5 @ 60&10&5 ⅌
Cast Fast Joint, Broad ... dis 60&5 @ 60&10&5 ⅌
Cast Loose Joint, Narrow } dis 70 @ 70&10 ⅌
Cast Loose Joint, Broad }
Cast Acorn, Loose Pin }
Cast Acorn, Japanned }
Cast Mayer's Loose Joint }
Wrought Loose Pin } dis 65&5 @ 65&10 ⅌
Wrought Table Hinges and Back Flaps }
Wrought Loose Joint }
Wrought Narrow Fast }

Blind Butts.
Parker ... dis. 75&2 ⅌
Clark ... dis. 75&10&5 ⅌
Shepard ... dis. 75&10&5 ⅌
Lull & Porter ... dis. 75&10 ⅌
Huffer's ... dis. 50 ⅌

Casters.—Bed (new list July 8, 1886) Plate ... dis 50 &10@60&5 ⅌

Chains.—German Halter and Coil, list June, 1884 ... dis. 55 @ 60
Galvanized Pump ... ₩ ℔ 5¼@5¾¢
Best Proof Coil Chain—English.

₩ ℔	10¼	7¼	6	5¼	5¼	5
	3-16	¼	5-16	⅜	7-16	½

Chisels.—Socket Framing ... dis 75@75&5 ⅌
Socket Firmer ... dis 75@75&5 ⅌
Butcher's ... $5 00@$5.25 to £ gold

Coffee Mills.—Box and Side (new list Jan. 1. 1880 ... dis 40&10 ⅌
Enterprise ... dis 20&10@30 ⅌

Cutlery.—Walden Pocket ... new list net
Pennsylvania Knife Co ... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Door Hangers.—Cronk Barn Door Hangers...No. 4, $12.00; No. 5, $14.00, No. 6, $18.00 dis. 50&10@50&15 ⅌
American Parlor Door Hanger ... $6.00; dis 20&10 ⅌

Drawing Knives.
Hart Mfg. Co. s ... dis. 75@75&5 ⅌
Adjustable Handle ... dis 20@25 ⅌

Files.
Nicholson ... dis 60&5@60&10 ⅌
Disston ... dis 60&10@60&10&10 ⅌
Butcher ...
Crown and Arrow ... 60&10&10@70 ⅌

Fluting Machines.
Eagle—3½ in. roll ... each, $2.15 } dis 35 ⅌
Eagle—5½ in. roll ... each, 2.85 }
Crown—4½ in. roll ... each, 3.50 }
Crown—6 in. roll ... each, 4.00 } dis 35 ⅌
Crown—8 in. roll ... each, 6.50 }
Geneva Fluter ... dis 25 ⅌
Favorite com. Fluter and Sad Iron..₩ doz., $10.50 net

Fry Pans.
Burnished ... dis 65&10 ⅌

₩ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
No.	0	1	2	3	4	5	6		8

Hammers.
Yerkes & Plumb's, new list ... dis 40&10 ⅌
Maydole Hammers, new list ... dis 25@25&10 ⅌
Howell A. E. Nail Hammers ... ₩ doz., net $3.75

Handles.
Disston Loop Handles Cross-Cut ... 20¢ pair net
Boynton Loop Handles Cross-Cut ... 20¢ pair net

Hatchets.
Yerkes & Plumb, new list ... dis 40&5 ⅌
Hunt ... dis 40 @ 40&5 ⅌

Hay and Straw Knives.
Lightning ... ₩ doz., $18.00 dis. 25 ⅌
Electric ... ₩ doz.. $9.50 @ 10.50
Wadsworth ... ₩ doz., net d's 40@40&5 ⅌
Walton Straw Knives ... ₩ doz. net 17.00
Gem Hay Knife ... ₩ doz $12.00@12.50

Hinges.
Strap and T ... dis 65&5 ⅌

Horse Nails.

	Nos. 5	6	7	8	9	10	
Globe	26	23	21	20	19	18	dis 12½&5&2½ ⅌
Ausable	30	27	25	24	23	22	dis 25&10&10 ⅌
Pol'ed and P't'd & Blued & P't'd.	31 28	26	25	24	23		dis 25&10&10 ⅌
Clinton	23	21	20	19	18		dis 40&5 ⅌
" Pol'ed & P't'd	24	22	21	20	19		dis 40&5 ⅌
Saranac	26	23	21	20	19	18	dis 25@30 ⅌

Locks and Knobs.
Branford Locks ... dis 55&5&2 ⅌
Parker's Cabinet ... dis 40&2 ⅌
American Padlocks ... dis 75@75&5 ⅌
Scandinavian Padlocks ... dis 50 ⅌

₩ doz.	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	dis 60 ⅌
No.	57	58	59	60	61	62	63	
₩ doz.	$18.00		26.00		33.00			dis 60 ⅌
No.	64		65		66			

Lanterns.
Buckeye ... large list, net; small list, net
Tubular, No. 0, $6.75@$7.00; No. 1, $8.25@8.50 ₩ doz. net
Guards 40¢ extra.

Lawn Mowers.—Pennsylvania } dis 50 ⅌
Philadelphia }
Excelsior }
Continental }
Quaker City }

Lawn and Garden Pumps.
Holland Patent ... list, $5.00, dis 10 ⅌

Mattocks.
Long and Short Cutter ... new list, 60&5 ⅌
Pennsylvania Pattern ... dis 60& 5 ⅌

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets. dis. 20&10 ⅌
Stebbins' Gates ... dis. 75&5 ⅌
Lincoln's Gates ... dis 66⅔&10 ⅌
Landers, Frary & Clark's Petroleum ... dis 40&10 ⅌
Brass Liquor Cocks new list Jan. 1. 1880. dis ... 50&5 ⅌
Cork Lined Cocks ... dis. 70 ⅌

Meat Cutters.
Dixon's ... dis. 45 ⅌
Woodruff ... dis. 45 ⅌
Stowe ... dis. 45 ⅌
American ... dis 30 ⅌
Stuffers ... dis. 40 ⅌
Enterprise Stuffers ... dis. 30

Parers, Apple and Peach.
Ideal Apple Parers ... per doz $5.00
Waverly Apple Parers ... per doz $4.50
Goodell White Mountain Apple Parers per doz $5.00
Goodell Lightning Apple Parers ... per doz $6 00
Monarch Peach Parers ... per doz $15.00 dis 10 ⅌

Planes.—Sandusky Tool Co ... dis 50 ⅌
Ogontz ... dis. 55 ⅌
Ohio and Auburn ... dis. 50 ⅌
Bailey (S. R. & L. Co.) ... dis. 30&10 ⅌

Plane Irons.—Ohio Tool Co ... dis. 20&10 ⅌
Butcher's ... $5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable ... dis. 70&10 ⅌
Stanley's Non-Adjustable ... dis. 70&10 ⅌

Picks.—New list ... 60&5@60&10 ⅌

Razor Strops.
Lamont Combination ... ₩ doz. $4.00
Lamont Combination ... 1 gross lots $40.00
Imitation Emerson ... ₩ doz. $2.00, 10&10 ⅌

Rules.—Stanley Boxwood ... dis. 80&5@80&10 ⅌
Stanley Ivory ... dis. 50 @50&10 ⅌

Steelyards.—Hart's Pattern ... dis 40&10@50&5 ⅌

Per doz.	$14.50	17.75	21.00	26.50	31.00	35.50
Lbs	50	100	150	200	250	300

American Pattern ... dis. 40&10@50 ⅌

Per doz.	$8.00	10.25	13.75	15.00	16.75	19.50
Lbs.	50	100	150	200	250	300

Scale Beams ... 60&5@60&10 ⅌
Custer's ... 30@33⅓ ⅌

Squares.
Steel and Iron. dis. 60&10 ⅌; full cases dis ... 70&10@70&10&10 ⅌
Try Squares, Stanley ... dis 60&10 ⅌
Disston's Try Squares ... dis 45 ⅌

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ... ₩ doz, dis 40 ⅌
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ... ₩ doz' dis 40 ⅌

Saws.—Disston's Hand, Panel and Rip ... dis 25 ⅌
Disston's Circular ... dis 45 ⅌
Cross-Cut No. 2, Plain Tooth ... dis 45 ⅌
Cross-Cut Patent Tooth ... dis 45 ⅌
Cross-Cut Champion Tooth ... dis 45 1

Shovels and Spades.
Oliver Ames & Sons, new list ... dis 20 ⅌
Griffiths, C. S ... dis 50&10 ⅌
Rowland ... dis 60@60&10 ⅌

Sad Irons.—4 to 10 ℔ ... ₩ ℔ 3¢
Mrs. Potts' Patent ... dis 35@40 ⅌

Stone.
Washita Extra ... ₩ ℔ 30¢
Washita No. 1 ... ₩ ℔ 25¢
Washita No. 2 ... ₩ ℔ 20¢
Washita Slips ... ₩ ℔ 50¢
Washita Axe ... ₩ ℔ 15¢
Hindostan Oil Stone No. 1 ... ₩ ℔ 4½ ⅌
Hindostan Axe Stone ... ₩ ℔ 5¢
Hindostan Slips ... ₩ ℔ 8¢

Screws.—Parker list (new list).
Flat Head Iron ... dis 75 ⅌
Flat Head Brass ... dis 70 ⅌
Round Head Brass ... dis 65 ⅌
Round Head Iron ... dis 70 ⅌

Spoons.
Plated ... dis 50&10@60 ⅌
German Silver ... dis 50 @ 50&5 ⅌
Britannia, Boardman's ... dis 60 ⅌
Britannia, Parker's ... dis 60&10@60&10&10 ⅌
Tinned ... dis 10 ⅌

Springs.—Torrey ... dis 50 ⅌
Gem No. 3 small Japanned ... $2.00 } dis 50&10 ⅌
Gem No. 2 medium Japanned ... 2.75 }
Coil No. 10 ₩ gross net ... $5.50@6.00
Other Standard Springs ... dis 50&10@60 ⅌
Warner Door Springs, ₩ doz. $2.50..dis 40&10 @ 50 ⅌
Standard Spring Hinges—
Single No. 0, ₩ doz. net ... $1.10@1.25
Single No. 1, ₩ doz. net ... 1.25@1.50
Other Standard Spring Hinges ... dis 25&10@40 ⅌

Stocks and Dies ... dis 40 @ 40&5 ⅌

Stove Polish.—Gem ... ₩ gross, $4.50, dis 10 ⅌
Dixon ... 6.00, dis 10 ⅌
Fire Fly ... $3.00 gross, net

Tacks ... Combination discounts
Shoe Nails—4-8, and over, 5½¢ } 10 ⅌
Shoe Nails—3½-8, and under 7¢ }
Double Pointed Tacks ... dis 80@80&10 ⅌

Traps.
Genuine Oneida—Newhouse ... dis 35@40 ⅌
Im. Oneida—Newhouse list, First qual. dis 60, 10&10 @ 70 ⅌

Vises.—Solid Box. Trenton new list ... dis 50, 10&5 ⅌

Wrenches.—Agricultural ... dis 80&10@80&10&5 ⅌
Coes' Genuine ... dis 55&3 ⅌
Coes' Mechanics' ... dis 55&10&3 ⅌
Coes' Mechanics,' Mall. Bar ... dis 80&10@80&10&5 ⅌

Wire.
Bright or Annealed, No. 0 to 18 ... dis 70 ⅌
Bright or Annealed, No. 19 to 26 ... dis 65&10 ⅌
Bright or Annealed, No. 27 to 36 ... dis 70@72½&5 ⅌
Coppered, 0 to 18 ... dis 60&10 ⅌
Tinned Broom Wire ... dis 60&5 ⅌
Galvanized Barb Wire ... 4¾¢
Painted Barb Wire ... 4¼¢
Galvanized, Nos. 7 to 18 ... Market List, dis ... 60 ⅌

Wringers.

	Per doz.	
Peerless No. 2½	27.00	Less $3 ₩ doz.
Peerless No. 3½	31.50	
Universal, No. 2½	27.00	
Universal, No. 2	30.00	
Universal, No. 1¾	31.50	
Universal, No. 1½	36.00	
Universal, No. 1	54.00	
Universal, for Set Tubs, A 2½	36.00	
Universal, for Set Tubs, E 1½	45.00	
Universal, for Set Tubs, C 1	63.00	
Novelty, for Common Tubs, No. 2 & 2½, 10 in	27.00	
Novelty for Common Tubs No. 3 & 3½, 11-in	31.50	
Excelsior, for Stationary Tubs, No. E, 10-inch	36.00	
Excelsior, for Stationary Tubs, No F, 11-inch	40.50	
Excelsior, with Folding Bench, No. A, 10-inch	45.00	
Excelsior, with Folding Bench, No. B, 11-inch	49.50	

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ⅌ cent. for cash if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.

1½ to 4 by ⅜ to 1 ... 2.0¢ | 1¼ and 1⅜ by ⅜ to ⅝. 2.1¢
4¼ to 6 by ⅜ to 1 ... 2.1¢ | 1 and 1⅛ by ⅜ to ⅝ ... 2.2¢
1⅜ to 6 by 1⅛ to 1½ ... 2.4¢ | ⅝, ¾ and ⅞ by ⅜ to ⅝. 2.4¢

Rounds and Squares.

1 to 1⅞ ... 2.0¢ | 4¼ to 5 ... 3.5¢ | ⅝ ... 2.6¢
2 to 2⅝ ... 2.2¢ | ¾ to ⅞ ... 2.1¢ | 5-16 ... 2.8¢
2¾ to 3¼ ... 2.5¢ | ⅝ to 9-16 ... 2.2¢ | ¼ ... 3.0¢
3⅜ to 4 ... 3.0¢ | ½ to 7-16 ... 2.4¢ | 3-16 ... 5.0¢

Oval Iron.

¾ to 1½ ... 2.4¢ | ⅝ ... 2.8¢
⅝ to ¾ ... 2.6¢ | ⅜ ... 3.2¢

Half Oval and Half Round.

¾ to 1¼ inch ... 2.7¢ | ⅝ inch ... 3.5¢
⅝ to ¾ " ... 3.2¢ | ⅜ " ... 5.0¢

Horse Shoe.

⅝ to 1⅛ by 5-16 to ¾ inch ... 3.0¢

Wagon Box Iron.

¾ inch, Nos. 13 & 14 ... 3.2¢ | ⅝ inch, Nos. 11 & 12 ... 3.3¢
¾ " " 11 & 12 ... 3.0¢ | ⅝ " " 13 & 14 ... 3.9¢
⅝ " " 13 & 14 ... 3.5¢ | ⅜ " " 11 & 12 ... 3.6¢

Heavy Bands.

3½ to 6 by ¼ & 5-16 .. 2.2¢ | ⅜ to ⅞ by ¼ & 5-16 .. 2.5¢
1½ to 3¼ by ¼ & 5-16 .. 2.2¢ | ⅝ & ¾ by ¼ & 5 16 ... 3.0¢
1 to 1⅜ by ¼ & 5-16 .. 2.3¢ |

Light Bands.

1⅛ to 6 by ⅛ to 3-16 ... 2.5¢ | ¾ & 11-16 by ⅛ to 3-16. 3.2¢
1⅛ to 6 by Nos. 11 & 12. 2.6¢ | ¾ & 11-16 by Nos. 11, 12. 3.3¢
1 to 1⅜ by ⅛ to 3-16 ... 2.6¢ | ⅝ & 9-16 by ⅛ to 3-16 .. 3.5¢
1 to 1⅜ by Nos. 11 & 12. 2.7¢ | ⅝ & 9-16 by Nos. 11, 12. 3.6¢
⅞ & 13-16 by ⅛ to 3-16. 2.9¢ | ½ inch by ⅛ & 3-16 ... 3.8¢
⅞ & 13-16 by Nos. 11, 12. 3.0¢ | ½ in. by Nos. 11 & 12 .. 3.9¢

Hoop Iron.

1¼ to 4, Nos. 13, 14, 15. 2.8¢ | ¾, Nos. 19 and 20 ... 3.7¢
1¼ to 2, Nos. 16, 17, 18. 2.9¢ | ¾, No. 21 ... 3.8¢
1¼ to 2, No. 19 ... 3.0¢ | ¾, No. 22 ... 3.9¢
1¼ to 2, No. 20 ... 3.1¢ | 11-16, Nos. 13, 14 & 15. 3.7¢
1¼ to 2, No. 21 ... 3.2¢ | 11-16, Nos. 16, 17 & 18. 3.8¢
1¼ to 2, No. 22 ... 3.3¢ | 11-16, Nos. 19 and 20 .. 3.9¢
15-16, 1 & 1⅛, Nos. 13, 14 & 15 ... 3.0¢ | 11-16, No. 21 ... 4.0¢
15-16, 1 & 1⅛, Nos. 16, 17 & 18 ... 3.1¢ | 11-16, No. 22 ... 4.1¢
15-16, 1 & 1⅛, Nos. 19 & 20 ... 3.2¢ | ⅝, Nos. 13, 14 and 15 .. 3.9¢
15-16, 1 & 1⅛, No. 21 ... 3.3¢ | ⅝, Nos. 16, 17 and 18 .. 4.0¢
15-16, 1 & 1⅛, No. 22 ... 3.4¢ | ⅝, Nos. 19 and 20 ... 4.1¢
⅞, Nos. 13, 14 and 15 .. 3.2¢ | ⅝, No. 21 ... 4.2¢
⅞, Nos. 16, 17 and 18 .. 3.3¢ | ⅝, No. 22 ... 4.3¢
⅞, Nos. 19 and 20 ... 3.4¢ | ⅝, No. 23 ... 4.4¢
⅞, No. 21 ... 3.5¢ | 9-16, Nos. 13, 14 & 15 .. 4.1¢
⅞, No. 22 ... 3.6¢ | 9-16, Nos. 16, 17 & 18 .. 4.2¢
13-16, Nos. 13, 14 & 15 .. 3.4¢ | 9-16, Nos. 19 and 20 ... 4.3¢
13-16, Nos. 16, 17 & 18 .. 3.5¢ | 9-16, No. 21 ... 4.4¢
13-16, Nos. 19 and 20 .. 3.6¢ | 9-16, No. 22 ... 4.5¢
13-16, No. 21 ... 3.7¢ | 9-16, No. 23 ... 4.6¢
13-16, No. 22 ... 3.8¢ | ½ inch, Nos. 13, 14, 15. 4.3¢
¾, Nos. 13, 14 and 15 .. 3.5¢ | ½ inch, Nos. 16, 17, 18. 4.4¢
¾, Nos. 16, 17 and 18 .. 3.6¢ | ½ inch, Nos. 19 & 20 .. 4.6¢
| ½ inch, No. 21 ... 4.7¢
| ½ inch, No. 22 ... 4.8¢
| ½ inch, No. 23 ... 4.9¢

The prices under Hoop do not apply to Cotton Ties. 1-10¢ ₩ ℔ extra will be charged for each gauge lighter than the lightest indicated.

1-10¢ ₩ ℔ extra will be charged for cutting Hoops to specified lengths

Barrel Hoops.
1¼ to 2 in., cut to length.

9 to 11 ℔, ₩ set of 6 hoops ... 3.0¢
8 ℔ and less than 9 ℔, ₩ set of 6 hoops ... 3.1¢
Less than — ℔, ₩ set of 6 hoops ... 3.2¢

Extras for cutting to length all preceding Iron, including Tire ... 1.10

Tank Iron.

No. 9 & heavier, 2.8 ; Plow Slabs, 3.0¢ Plow Wings, 3.3¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.0¢	4.5¢	6.0¢
Nos. 15 to 17	3.3¢	4.8¢	6.3¢
Nos. 18 to 21	3.6¢	5.1¢	6.6¢
Nos. 22 to 24	3.8¢	5.3¢	6.8¢
Nos. 25 and 26	4.0¢	5.5¢	7.0¢
No. 27	4.2¢	5.7¢	7.2¢
No. 28	4.6¢	6.1¢	7.6¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.

1st quality (A) ... 10¢ | 2d quality (B) ... 9¢

American Galvanized Sheets.
(Sono C. H. B.) Brand. Patent Leveled:

Nos. 14 to 20 ... 12¢ | No. 27 ... 15¢
Nos. 21 to 24 ... 13¢ | No. 28 ... 16¢
Nos. 25 and 26 ... 14¢ | No. 29 ... 18¢
60 @ 62½ ⅌ discount.

Coal Screen Iron.

1⅛ by ⅝ by 5-16 ... 2.5¢ | 1 by ⅝ by 5-16 ... 3.0¢

Angle Iron.

2½, 3, 3½ and 4 inch .. 2.8¢ | 1⅛ by 1, for Pl. Hand .. 3.3¢
1½, 1¾, 2 and 2¼ " .. 2.8¢ | 1⅛ by ⅞ " " .. 3.3¢
1¼ inch ... 2.9¢ | 1⅛ by ¾ " " .. 3.4¢
1 " ... 3.1¢ |

T Rail.

8 ℔ to the yard ... 2.4¢ | 20 ℔ to the yard ... 2.3¢
12 " " ... 2.3¢ | 28 " " ... 2.3¢
16 " " ... 2.3¢ | 30 " " ... 2.3¢

Splice Joints for 12, 16 and 20 ℔ Rail, 30¢ each; 28 and 30 ℔ Rail, 40¢ each: 40 ℔, 50¢ each.
3½ by ⅜ and ½ Spikes for 20 and 28 ℔ Rail ... 3¼¢
2½ and 3 by ⅜ " " 12 and 16 ℔ " ... 3.5¢
2½ by 5-16 " " 8 ℔ Rail ... 4.0¢

Flat Rails.—Punched and Countersunk.

1⅛ to 2 by ½ to ⅝ inch ... 2.5¢
1⅛ by ⅜ and 7-16 inch ... 2.7¢
1⅛ by ⅜, 7-16 and ½ inch ... 3.0¢

Juniata Nail Rods, 6.0¢; Norway Nail Rods, 7.5¢.
Guard Iron, ⅝x⅝x⅜ and ¾x¾x⅜ ... 3.5¢
Guard Iron ⅝x⅝x9-16 and ¾x¾x½ ... 3.7¢
Drag Bars ... 2.8¢ | Cyl. & Landside Iron .. 2.7¢
Dropper Bars ... 3.3¢ | Plow Beam Iron ... 2.5¢

Nails.

See Pittsburgh Trade Report.

Tool Steel.

Classification Adopted April 13, 1886, Steel Association of United States.

ROUND, SQUARE AND OCTAGON.

⅝ to 2 ... base, 8.0¢ | 6½ to 7 ... 3.0¢ | ¼ & 9-32. 3.0¢
2⅛ to 3 ... ext. 1.0¢ | 7⅛ to 8 ... 3.5¢ | 3-16 ... 5.0¢
3⅛ to 4 ... 1.5¢ | 9-16 to ½ ... 0.5¢ | 5-32 ... 10.0¢
4⅛ to 5 ... 2.0¢ | 7-16 to ⅜ ... 1.0¢ | ⅛ ... 18.0¢
5⅛ to 6 ... 2.5¢ | 5-16 and 11-32 2.0¢ |

FLATS.

2 to 9-16 inches wide x 2 to ⅝ inches thick ... base, 8.0¢

List of Extras ₩ ℔.

⅛ x 3-16 ... 20.0¢ | 5-16 x ⅜ to ⅝ ... 1.5¢
⅛ x ¼ ... 15.0¢ | 5-16 x 11-16 to 8, ⅜ x 7-16 to 8 ... 1.0¢
⅛ x 5-16 ... 8.0¢ | 7 16 x ½ to 8 ... 1.0¢
⅛ x ⅜ ... 4.0¢ | ½ x 9-16 to 8, 9-16 x 2⅛ to 8 ... 1.0¢
⅛ x 7-16 to ½ ... 3.0¢ | ⅝ to 2 in. x 2⅛ to 7 .. 1.0¢
⅛ x 9-16 to 7 ... 2.0¢ | ⅝ to 1¾ x 7⅛ to 8 ... 1.0¢
⅛ x 7⅛ to 8 ... 3.0¢ | 1⅞ to 2 x 7⅛ to 8 ... 1.5¢
3-16 x ¼ ... 5.0¢ | 2⅛ to 3 x 2⅛ to 5 ... 1.0¢
3-16 x 5-16 ... 4.0¢ | 2⅛ to 3 x 5⅛ to 8 ... 1.5¢
3-16 x ⅜ ... 3.0¢ | 3⅛ to 4 x 3⅛ to 6 ... 1.5¢
3-16 x 7-16 to ⅝ ... 2.0¢ | 3⅛ to 4 x 6⅛ to 8 ... 2.0¢
3-16 x 11-16 to 2 ... 1.5¢ | 4⅛ to 5 x 4⅛ to 7 ... 2.0¢
3-16 x 2⅛ to 7 ... 1.0¢ | 4⅛ to 5 x 7⅛ to 8 ... 2.5¢
3-16 x 7⅛ to 8 ... 2.0¢ | 5⅛ to 6 x 5⅛ to 8 ... 2.5¢
¼ x 5-16 to ⅜ ... 2.0¢ | 6⅛ to 7 x 6⅛ to 7 ... 3.0¢
¼ x 7-16 to ⅝ ... 1.5¢ | 6⅛ to 8 x 7⅛ to 8 ... 3.5¢
¼ x 11-16 to 2 ... 1.5¢ |
¼ x 2⅛ to 7 ... 1.0¢ |
¼ x 7⅛ to 8 ... 2.0¢ |

Cutting to multiples or specified lengths, ½¢ ₩ ℔ for over 24 in.; under, according to contract.

Crucible Steels.

CRUCIBLE MACHINERY, ROUNDS AND SQUARES.

¾ to 3 inches ... base, 5.0¢ | ⅜ to 7-16 in ... extra, 0.5¢
3⅛ to 4 in ... extra, 0.5¢ | 5-16 and 11-32 in .. ex., 1.0¢
4⅛ to 5 in ... extra, 1.0¢ | ¼ and 9-32 ... extra, 1.5¢
5⅛ to 6 in ... extra, 1.5¢ | 3-16 inch ... extra, 3.0¢
½ to 11-16 in ... extra, 0.2¢ |

Octagons, ½¢ extra throughout the list. Flats, one-half the extras of the Flat Tool Steel classification. Cutting to multiples or specified lengths, ½¢ per pound for anything over 24 inches long. For lengths 24 inches or less, according to to special contract.

CRUCIBLE SPRING STEEL, FLAT.

1¼ to 4 in. x No. 4 gauge to ½ in. inc ... base, 4.0¢
1 and 1⅛ in. x No. 1 gauge to 4 gauge inc ... extra, 0.2¢
1 to 3 in. x No. 5 gauge to 7 gauge inc ... extra, 0.5¢
⅞ to 3 in. x No. 8 gauge to 10 gauge inc ... extra, 1.0¢
¾ to 3 in. x No. 11 gauge to 16 gauge inc ... extra, 2.0¢
⅝ to 3 in. x No. 17 gauge to 20 gauge inc ... extra, 3.5¢
⅜ to ⅝ in. x No. 10 gauge to 16 gauge inc ... extra, 4.0¢
⅜ to ⅝ in. x No. 17 gauge to 20 gauge inc ... extra, 5.0¢
⅜ to ⅝ in. x No. 21 gauge to 24 gauge inc ... extra, 6.0¢

Cut to length, 24 inches and over, ¼¢ per pound extra; and under, according to special contract.

ROUND AND SQUARE CRUCIBLE SPRING STEEL.

⅝ to 1½ inches .. base, 5.0¢ | 5-16 in ... extra, 1.0¢
½ to 9-16 in ... extra, 0.2¢ | ¼ in ... extra, 1.5¢
⅜ to 7-16 in ... extra, 0.5¢ |

CRUCIBLE SHEET STEEL, TOOL GRADE.

To 21 gauge base, 9.0¢; 22 gauge, extra, 1.0¢; and 1¢ advance of extra for every No. of gauge to No. 26.
Spring Sheet Steel ... base, 7¢
Common Sheet Steel ... base, 6¢
Open-Hearth Shovel Sheet Steel ... base, 4¢

CRUCIBLE CIRCULARS.

Diameter. | Diameter.
To 46 inch ... base, 11¢ | 56 to 60 inch .. extra, 5¢
48 inch ... extra, 1¢ | 62 to 64 inch .. extra, 7¢
50 inch ... extra, 2¢ | 66 to 70 inch .. extra, 9¢
52 to 54 inch .. extra, 3¢ | 72 inch ... extra, 11¢

Bessemer and Open-Hearth Steels.

MACHINERY ROUNDS AND SQUARES.

¾ to 3 in. inc ... base, 3.0¢ | Extra. ½ to 11-16 inch inc ... 0.2¢
| ⅜ to 7-16 inch inc ... 0.3¢
3⅛ to 4 inches inc ... 0.3¢ | 5 16 and 11-32 in. inc .. 0.5¢
4⅛ to 6 inches inc ... 1.0¢ | ¼ and 9-32 inch inc ... 0.7¢

Machine cutting to specified lengths above 24 in .. 0.2¢
Machine cutting to specified lengths, 12 to 24 in ... 0.4¢
Machine cutting to specified lengths, less than 12 in., according to contract, but not less than 0.6¢ extra on each size. Shearing or sawing, one-half of the above extras for cutting.

MACHINERY FLATS

1¼ in. and wider x ⅜ to 1 in. thick ... base, 3.0¢
1¼ in. and wider x ¼ to 5-16 in. thick ... extra, 0.1¢
1¼ in. and wider x 3-16 and 7-32 in. thick .. extra, 0.2¢
1¼ in. and wider x ⅛ and 5-32 in thick ... extra, 0.3¢
¾ in. to 1⅛ in. x ⅜ to 1 in. thick ... extra, 0.2¢
¾ in. to 1⅛ in. x 3 16 and 7-32 in. thick ... extra, 0.3¢
¾ in. to 1⅛ in. x ⅛ and 5-32 in. thick ... extra, 0.5¢
⅜ in. to ⅝ in. x ¼ to ½ in. thick ... extra, 0.3¢
⅜ in. to ⅝ in. x 3-16 and 7.32 in. thick ... extra, 0.5¢
⅜ in. to ⅝ in. x ⅛ and 5-32 in. thick ... extra, 0.7¢
⅜ in. to 1⅛ in. x 1-16 and 3-32 in. thick ... extra, 2.0¢
1¼ in. to 3 in. x 1-16 and 3-32 in. thick ... extra, 1.0¢

Sizes of flats not named in above list shall be one-half the extras of same size of Tool Steel.

TIRE STEEL, ROUND EDGES.

¼ inch and wider x ⅜ to 1 inch thick ... base, 2.8¢
Extras same as Flat Machinery extras.

TIRE STEEL, SQUARE EDGES.

Throughout the list 0.2¢ more than for same sizes of Round Edge Tire.

TOE-CALK STEEL.

1¼ inches and wider x ⅜ to 1 inch thick ... base 2.9¢
Extras same as Machinery Extras

SLEIGH-SHOE STEEL.

1¼ inches and wider x ⅜ to 1 inch thick ... base, 2.7¢
Extras same as Machinery Extras.

SPRING STEEL FLAT.

1¼ to 4 in. x No. 4 gauge to ½ in. inc ... base, 3.0¢
1 and 1⅛ in. x No. 1 gauge to 4 gauge inc ... extra, 0.2¢
1 to 3 in. x No. 5 gauge to 7 gauge inc ... extra, 0.5¢
⅞ to 3 in. x No. 8 gauge to 10 gauge inc ... extra, 1.0¢
¾ to 3 in. x No. 11 gauge to 16 gauge inc ... extra, 2.0¢
⅝ to 3 in. x No. 17 gauge to 20 gauge inc ... extra, 3.5¢
⅜ to ⅝ in. x No. 10 gauge to 16 gauge inc ... extra, 4.0¢
⅜ to ⅝ in. x No. 17 gauge to 20 gauge inc ... extra, 5.0¢
⅜ to ⅝ in. x No. 21 gauge to 24 gauge inc ... extra, 6.0¢

Bessemer and Open-Hearth cut to length, 24 inches and over, 0.1¢ per pound extra; and under, by special contract.

ROUND SPRING STEEL.

⅝ to 1½ inches .. base, 3.0¢ | 5-16 inch ... extra, 1.0¢
½ to 9-16 in ... extra, 0.2¢ | ¼ inch ... extra, 1.5¢
⅜ to 7-16 in ... extra, 0.5¢ |

CUTLERY STEEL.

14 gauge thick and heavier ... base, 3.2¢
15, 16 and 17 gauge ... extra, .3¢
18 and 19 gauge ... extra, .5¢
Rounds, ¾ diameter and heavier ... base, 3.3¢
Rounds, smaller sizes, extras same as Machinery.
Double bevel, 14 gauge and heavier ... 4.2¢
Double bevel, thinner than 14 gauge ... extra, 1¢
Fork Steel, Open-Hearth or Bessemer ... 3.2¢
Rake Steel, Open-Hearth or Bessemer ... 3.5¢
Hoe Steel, Open-Hearth or Bessemer ... 3¢
Screw-Driver Steel, Open-Hearth or Bess ... ₩ ℔ 4.2¢
Auger Bit Steel, Open-Hearth or Bessemer ... 3.5¢
Plow Slabs, Open-Hearth or Bessemer ... 2.5¢

Ovals and Half Ovals, Half Rounds and Special Shapes subject to special agreement, but at prices not less than Rounds of same weight ₩ foot.

No freight allowance shall be made on less than 500 pounds of Steel in one shipment.

MISCELLANEOUS.

Axle Billets ... 2 ¢ | Thrasher Steel ... 2½¢
Scythe Back Steel ... 3 ¢ | Thrasher Teeth ... 3½¢
Grain Drill Bars ... 2½¢ | Rolled Ham'r Billets .2½¢
Grain Drill Points ... 3½¢ |
Cutter Shoe, cut to lengths and tapered ... 3¢
Rolling Coulter Blanks, cut and punched ... 6¢

Terms.—Four months: 3 per cent. discount for cash if remitted within 30 days.

Plate Steel.

Tank Steel ¼ inch thick and heavier ... base, 3.0¢
Tank Steel 3-16 inch thick and heavier ... extra, 0.3¢
Tank Steel 8 gauge and 9 gauge thick ... extra, 0.5¢
Tank Steel 10 gauge to 12 gauge thick ... extra, 0.7¢
Shell Steel, ¼ inch thick and heavier, 50,000 to 60,000 pounds tensile strength ... base, 3.25¢
Shell Steel, 3-16 inch thick, 50,000 to 60,000 pounds tensile strength ... extra, 0.3¢
Shell Steel, 8 gauge and 9 gauge thick, 50,000 to 60,000 pounds tensile strength ... extra, 0.5¢
Shell Steel, 10 gauge to 12 gauge thick, 50,000 to 60,000 pounds tensile strength ... extra, 0.7¢
Shell Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ¼¢
Shell Steel Plates, 100 inches to 105 inches wide, extra on each thickness, ½¢
Shell Steel Heads, 95 inches diameter to 105 inches diameter ... extra on each thickness, ½¢
Shell Steel Heads, 105 inches diameter to 108 inches diameter ... extra on each thickness, 1.0¢
Flange Steel, ¼ inch thick and heavier, 50,000 to 60,000 pounds tensile strength ... base, 3.5¢
Flange Steel, 3-16 inch thick, 50,000 to 60,000 pounds tensile strength ... extra, 0.3¢
Flange Steel, 8 gauge and 9 gauge thick, 50,000 to 60,000 pounds tensile strength ... extra, 0.5¢
Flange Steel, 10 gauge to 12 gauge thick, 50,000 to 60,000 pounds tensile strength ... extra, 0.7¢
Flange Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ¼¢
Flange Steel Plates, 100 inches to 105 inches wide, extra on each thickness, ½¢
Flange Steel Heads, 95 inches diameter to 105 inches diameter ... extra on each thickness, ½¢
Flange Steel Heads, 105 inches diameter to 108 inches diameter ... extra on each thickness, 1¢
Best Boiler Steel, ¼ inch thick and heavier, 50,000 to 70,000 pounds tensile strength ... base, 4¢
Best Boiler Steel, 3-16 inch thick, 50,000 to 70 000 pounds tensile strength ... extra, 0.3¢
Best Boiler Steel, 8 gauge and 9 gauge thick, 50,000 to 70,000 pounds tensile strength ... extra, 0.5¢
Best Boiler Steel, 10 gauge to 12 gauge thick, 50,000 to 70,000 pounds tensile strength ... extra, 0.7¢
Best Boiler Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ¼¢
Best Boiler Steel Plates, 100 inches to 105 inches wide ... extra on each thickness, ½¢
Best Boiler Steel Heads, 95 inches diameter to 105 inches diameter ... extra on each thickness. ½
Best Boiler Steel Heads, 105 inches diameter to 108 inches diameter ... extra on each thickness, 1¢
Best Locomotive Fire-Box Steel ... 4.5¢

Heads, when not in complete Boiler sets, to be ¼¢ per pound extra on each above grade, thickness and size. No Steel to be sold as Marine Boiler Steel except Best Boiler grade. Tank Steel, not stamped, ¼¢ per pound less than Shell Steel, subject to same classification.

Miscellaneous Cast Steel.

Auger and Auger Bit ... 8¢ | Roller ... 5½¢
Axle Steel for carriages and wagons ... 3¢ | Spindle, subject to Machin'y classification. 5½¢
Frog Points & Plates. 5½¢ | Trap Spring Steel ... 6¢
Frog Side Bars ... 5¢ | Forged Crank Pins and Lathe Spindles ... 7½¢
Pick, plain (hammered) 5¢ | Piston Rods, plain ... 4¢
Pick and Mattock, beveled (rolled) ... 3¢ | Piston Rods, forged to shapes ... 7½¢
Skate Steel ... 4½¢ | Slide Bars, plain ... 5¢
Pike and Cant Hook ... 7¢ | Do., forged to shapes ... 7½
Coal & Granite Wedge .. 7¢ |

FILE CAST STEEL.

Square, Round, Half Rnd and Flat Bastard, 8 in. and over ... | Mill Saw, 8-in. and over 7¢
| Taper, 3½-in. and over .. 6¢
| Horse and Shoe Rasp ... 5¢

SPRING CAST STEEL.

Spiral, Taper, cut to lengths ... 5½¢
Solid Safe Cast Steel ... 4¢
Three and Five Ply Cast Steel ... 5¢

AGRICULTURAL IMPLEMENT CAST STEEL.

Fork & Rake, Crucible .. 4¢ | Corn Stalk Cutter, bev .. 4¢
Horse Rake Steel cut to lengths, Crucible ... 5¢ | beveled Hoe and Shovel Steel in Bars ... 4½¢
Hoe, Crucible ... 5¢ | Cruc. Plow St'l in Slabs. 4¢

Rolls and Castings.

Per lb.
Furnace and Floor Plates ... 1¢
Sand Rolls over 12 inches diameter ... 2½¢
Sand Rolls 12 inches diameter and under ... 3¢
Roll Pinions over 12 inches diameter ... 2½¢
Roll Pinions 12 inches diameter and under ... 3¢
V-Tooth Pinions additional ... ½¢
Housen and Rolling Mill Castings not otherwise specified ... 2½¢
Spindles and Coupling Boxes ... 2½¢
Squeezer Castings ... 2½¢
Squeezer Pinions and Wheels ... 2¾¢
Guide Plates ... 2½¢
Spur and Bevel Wheels, large ... 3¼¢
Spur and Bevel Wheels, small ... 3¾ to 4½¢
Pulleys, up to 30 inches ... 4¢
Pulleys, over 30 inches ... 3½¢
Engine Castings, light ... 4½¢
Engine Castings, heavy ... 3¾¢

White and Red Lead.

Strictly Pure White Lead in Oil, in Kegs. In lots of 500 ℔ and upward, 6¼¢ ₩ ℔; in lots less than 500 ℔, 6⅜¢ ₩ ℔ net; in 25-℔ cans, packed in 100-℔ cases, ½¢, and 12½-℔ cans, 1¢, over keg price; in 1 to 5 ℔ cans, assorted, in 100-℔ cases, 2½¢ over keg price.
Strictly Pure Dry White Lead in kegs, ₩ ℔ ... 6¼¢
Strictly Pure Red *extra bright and fine*, in kegs ... 6 ¢
Strictly Pure Litharge, *powdered, ext. fine*, in kegs .. 6 ¢
Orange Mineral, *True*, in barrels ... 8½¢

Terms: Note or acceptance at 60 days; or less 2½ ⅌ for cash if paid within 15 days from date of invoice. Freight equalized with corroding points.

Window Glass.

Discount, 70&10 ⅌ Single Strength 70&10 ⅌ Double
Price current ₩ box of 50 feet.

Single Strength.

United Inches	Sizes.	AA.	A.	B.	C.
25	6 x 8 to 10 x 15	$8.75	$8.00	$7.50	$7.00
40	11 x 14 to 15 x 24	10.00	9.25	8.75	8.00
50	16 x 24 to 20 x 28	12.50	11.50	10.25	9.00
54	15 x 34 to 24 x 30	13.25	12.00	10.75	9.50
60	26 x 28 to 24 x 36	14.50	13.00	11.50	10.25
70	26 x 36 to 26 x 44	15.00	14.50	12.25	11.00
80	26 x 46 to 30 x 50	16.75	15.25	13.75	11.75
84	30 x 52 to 30 x 54	17.50	16.00	14.25	....
90	30 x 56 to 34 x 56	19.25	17.50	15.75	....
94	34 x 58 to 34 x 60	20.75	18.75	16.75	....
100	36 x 60 to 40 x 60	22.25	20.75	18.50	....
	Double Strength.				
25	6 x 8 to 10 x 15	13.00	12.00	11.00	10.00
34	11 x 14 to 15 x 24	15.50	14.00	13.00	12.00
48	16 x 24 to 20 x 28	19.50	17.75	16.25	....
54	15 x 34 to 24 x 30	20.75	19.00	17.00	....
60	26 x 28 to 24 x 36	22.00	20.25	18.75	....
70	26 x 36 to 26 x 44	24.00	21.25	19.00	....
80	28 x 46 to 30 x 50	25.00	23.00	20.50	....
84	30 x 52 to 30 x 54	26.50	24.50	22.00	....
90	30 x 56 to 34 x 56	28.50	26.25	23.50	....
94	35 x 58 to 34 x 60	31.50	29.00	26.00	....
100	36 x 60 to 40 x 60	34.50	31.75	28.50	....

Sizes above — $10 ₩ box extra for every 5 inches.
An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, & Co.'s Goods.

Axes, Single Bit, Lippincott ... per doz., $7.00
Axes, Single Bit, James & Co ... per doz., 6.25
Axes, Double Bit, Lippincott ... per doz., $12.00
Axes, Double Bit, James & Co ... per doz. 10.00
Drain Tools, list ... dis 20&7½&5 ⅌
Hoes, Planters' and Scovill Pattern ... dis 50 ⅌
Hoes, Handled, Square Eye, German ... dis 50 ⅌
Handles, Cross Cut ... per doz., $2.25
Handles, Shovel, Bent, Bored, Riveted .. per doz., 2.00
Saws, Circular ... dis 50 ⅌
Saws, Long ... dis 45 ⅌
Saws, Cross Cut, H. B. & Co., Champion, foot net .. $0.27
Saws, Cross Cut, Lippincott, Champion, foot net .. $0.25
Shovels, list ... dis 20&7½&5 ⅌
Spades, list ... dis 20&7½&5 ⅌
Scoops, list ... dis 20&7½&5 ⅌

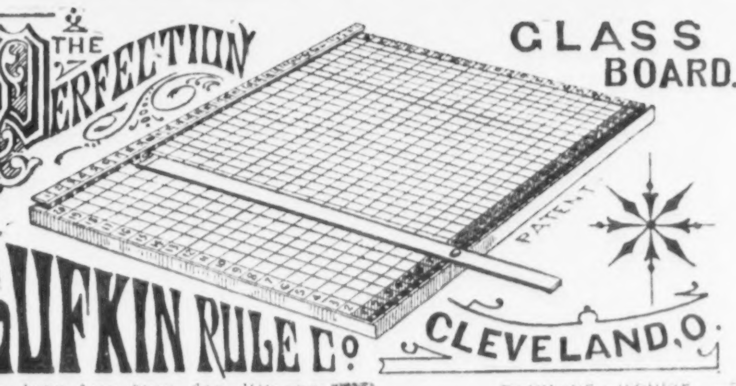
GEO. B. TURRELL, President. C. F. FERNALD, Manager. M. B. DUNBAR, Treasurer.

Safety Dog Muzzles

——MADE BY THE——
UNION HARDWARE CO.,
Torrington, Conn.
New York Office, 95 Chambers St., in charge of Tower & Lyon.

JESSE JONES & CO.
No. 615 COMMERCE ST.
PHILADELPHIA Pa.
HARDWARE SHELF BOXES
MADE OF WOOD WITHOUT NAILS OR SCREWS.
UNBREAKABLE
SEND FOR CATALOGUE.
PAPER BOXES ALL KINDS FOR HARDWARE.

THE PERFECTION GLASS BOARD.



LUFKIN RULE Co. CLEVELAND, O.
See Iron Age, Nov. 4th, '86. Send for Circular.

THE ESSEX HORSE NAIL CO., LIMITED
ESSEX ESSEX CO., NEW YORK.
The Essex Horse Nails
Are drawn from the best Swedes Iron Rods only. They are hot-forged and cold-pointed rendering them tough, stiff and easy driving, and are warranted
FIRST-CLASS IN EVERY RESPECT.
All Nails branded "ESSEX" are Fully Guaranteed.
J. C. McCARTY & CO., 97 Chambers St., New York, AGENTS.

AXLEINE

is a fine quality of Axle Grease, put up in square tin boxes containing one pound, beautifully decorated in assorted colors, designed especially for the Hardware Trade. Showy and attractive shelf goods.

Send or sample and prices.

LOVELL TRACY & CO., 71 Asylum St., Hartford, Conn

LANE'S PATENT STEEL DOOR HANGER.
The most perfect Anti-Friction Hanger in the Market,
BECAUSE

It is made of steel throughout, except the wheel which has a steel axle. It will not break. It is practically free from wear. It is almost noiseless in action. It requires no oil. It has a broad bearing on the door, and keeps in line. It is by far the most durable. It may be used with any track. It is always in order.

LANE'S PATENT TRACK

Is made of steel and is easily put in position. Catches and holds no snow or ice. Door hung thereon cannot jump the track. Is not subject to decay. Requires no fitting, but is ready at once. May be used with hangers of other manufacture.

Manufactured by LANE BROS., Poughkeepsie, N. Y.
JOHN H. GRAHAM & CO., General Agents, 113 Chambers Street, NEW YORK.

"THE BEST IS THE CHEAPEST."

The Pikes have made Scythe Stones since 1823, and pride themselves on the superior quality of their brands. They own the best quarries for Scythe Stones in the world. They with their employees, having had many years' experience, know how to select the best grits, and put up only pure, sharp gritted stone as Extra and No. 1 qualities, that can be used without water and not glaze. Hard enough to cut away steel fast, and strong enough not to break easily. You get better value in one of Pike's Scythe Stones than in a hundred poor, cheap stones. There is more *profit* per gross in selling Pike's Brands than you get for an entire gross of cheap stone. For instance:

You buy 50 gross cheap stone at $3 per gross - - - -	$150
You sell 50 gross cheap stone at $3.50 per gross - - - -	175
Profit, -	$25
You buy 50 gross Pike's good Scythe Stones at $6 - - -	$300
You sell 50 gross Pike's good Scythe Stones at $1 per doz.	600
Profit, -	$300

Which is the better, to make $25 and sell a worthless article, or for the same work make $300 and sell a splendid stone that will do good work and please all?

Be sure and buy only some of the following Genuine Brands:

Pike's Indian Pond, No. 1 and Extra.	Pike's Magic and Gilt Edge.
" Black Diamond and Lamoille	" White Mountain.
" Dodge Chocolate.	" Diamond Grit.
" 9 and 10 inch Ragg No. 1.	" Genuine N. H. Darby.
" Gritty and Diamond Pearl.	" German Pattern.
" Willoughby Lake.	" Mowing Machine.
	" Green Mountain.
	" Farmers' Choice and Union

We also keep in stock

English Talacre.	Labrador Kitchen Stone.
Vienna Emery.	Emery Table Hones.
Emery Scythe Rifles.	Hacker Stone, &c., &c.

OIL AND WATER STONES.

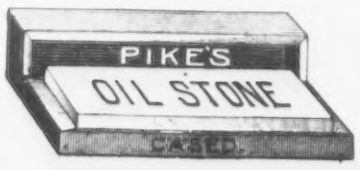
We manufacture the largest line in the world, viz:

Washita, the whitest and best.	Labrador, Nova Scotia, Gritty Pearl.
Arkansas, the hardest, finest grit stone found.	Sandstone and Pike's "Dodge" Chocolate, a fast, free-cutting Oil or Water Stone.
Turkey, we import the rough Rock.	
Hindostan, of all kinds also.	

We will send a handy Desk-stone and Paper-weight as sample by mail for 10 cents.

When you buy Whetstone of any kind call for Pike's Brands, and take no others if you want good stones.

Price-Lists sent to Dealers.



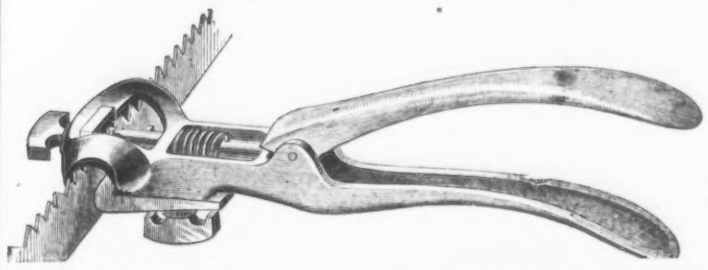
R. WALLACE & SONS' MANUFACTURING COMPANY,

MANUFACTURERS OF SOLID SILVERWARE GUARANTEED $\frac{925}{1000}$ FINE, ALSO NICKEL SILVER HOTEL AND TABLEWARE.

Factories, WALLINGFORD, CONN. New York House, 21 PARK PLACE.

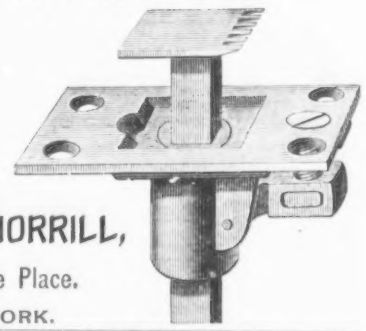
MORRILL'S PERFECT SAW SETS AND BENCH STOP.

FOR SETTING EVERY VARIETY OF SAWS.

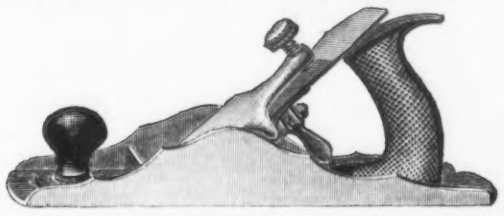


For price lists and discounts Address

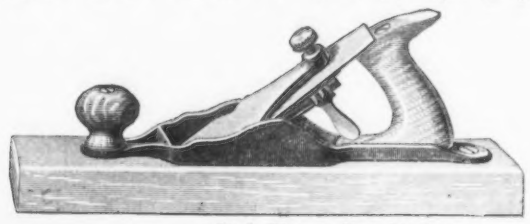
CHAS. MORRILL,
64 College Place.
NEW YORK.



CHAPLIN'S PATENT IRON AND WOOD BOTTOM PLANES.



Jacks and Jointers.

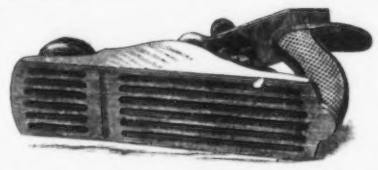


Jack Plane.—Nos. 77, 78.

Nos. 20 and 30 Blocks.

These planes (*with a smooth face*) have been in the market for many years, obtaining a steadily increasing trade as they have become known. We claim for them the utmost simplicity of construction, prompt adjustment and superior beauty of style and finish.

The clamp plate and lever are nickel-plated; the handle is of checkered rubber, which is stronger than any wood handle, and affords an easy, firm grip—also made with nickled iron handle.



Smooth Plane, Corrugated Bottom.

This Cut shows the surface of our new Corrugated Iron Planes. The corrugations afford ample air spaces, and reduce the traction and friction to the minimum. Same price as smooth face.

Corrugated face.	Smooth face.	
	No. 202, Iron Smooth Plane, 7x1⅛ in. Cutter	$3.00
	No. 203, Do., do., 8x1¾ in. do	3.52
	No. 204, Do., do., 9x1¾ in. do	3.35
No. 1205	No. 205, Do., do., 9x2 in. do	3.50
	No. 206 Iron Jack Plane, 12x2	3.85
No. 1207	No. 207, Iron Jack Plane, 15x2⅛	4.25
No. 1208	No. 208, Iron Fore Plane, 18x2¼	5.00
No. 1210	No. 210, Iron Joiner Plane, 22x2⅛	5.75

Corrugated face.	Smooth face.	
	No. 211, Iron Joiner Plane, 24x2⅜.	$6.75
	With Adjustable Throat.	
	No. 233, Iron Smooth Plane, 8x1¾.	3.50
No. 1255	No. 255, Iron Smooth Plane, 9x2	3.75
	All of these Planes are nickel plated finish.	
	No. 20, Block Plane, Japanned, 6½x1⅝ in. Cutter	1.40
	No. 30, Block Plane, Nickel-Plated, 6½x1⅝ Cutter.	1.65

The Adjustable Mouth Smooth Plane is a new feature, and meets with a great deal of favor.

OUR NEW

WOOD BOTTOM PLANES.

The Clamping Plate and Lever are nickel-plated; the Beechwood has been thoroughly seasoned and is a thicker block than usual, though the Plane is no heavier than those already in the market.

No. 72.	Smooth Plane, 7 x1¼ inch Cutter,		$2.00
" 73.	" " 8 x1¾ " "		2.00
" 74.	" " 8½x2 " "		2.00
" 75.	Handled Smooth Plane, 9x2 in. Cutter,		2.50
" 76.	" " " 10x2⅜ "		2.75
" 77.	Jack Plane, 15x2⅛ inch Cutter,		2.35
" 78.	" " 15x2¼ " "		2.60
" 79.	Fore Plane, 18x2⅜ inch Cutter,		2.75
" 80.	" " 20x2⅜ " "		2.75
" 81.	Jointer Plane, 22x2⅜ inch Cutter,		3.00
" 82.	" " 24x2½ " "		3.10
" 83.	" " 26x2⅝ " "		3.25
" 84.	" " 28x2⅝ " "		3.25

FOR SALE BY THE HARDWARE TRADE.

TOWER & LYON, MANUFACTURERS, 95 CHAMBERS STREET, NEW YORK.

THE FOLLOWING JOBBERS CARRY A GOOD ASSORTMENT.

BIGELOW & DOWSE, Boston.
WALBRIDGE & CO., Buffalo.
JOSEPH WOODWELL & CO., Pittsburgh.
LOGAN, GREGG & CO., Pittsburgh.
KRUSE & BAHLMANN, Cincinnati.
A. F. SHAPLEIGH & CANTWELL HDW. CO., St. Louis
WITTE HDW. CO., St. Louis.
EDWIN HUNT'S SONS, Chicago.
BUHL, SONS & CO., Detroit.
BLACK HARDWARE CO., Detroit.
WM. FRANKFURTH HDW. CO., Milwaukee.
McINTOSH, HUNTINGTON & CO., Cleveland.
FARWELL, OZMUN, KIRK & CO., St. Paul.
JANNEY, SEMPLE & CO., Minneapolis.
BLISH, MIZE & SILLIMAN, Atchison.
PARK, CRANCER & CO., Leavenworth.
FROTHINGHAM & WORKMAN, Montreal, Can.
CAVERHILL, LEARMONT & CO., Montreal, Can.
WM. THOMSON & CO., Toronto, Can.
WOOD & LEGGAT, Hamilton, Can

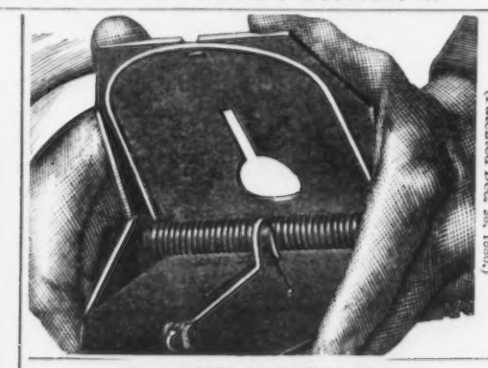
THE EUREKA SPIRAL SCREW DRIVER.

By pushing on the end of handle it will drive a screw in ¼ of the time of the old method. Sold by C. E. Jennings & Co. N. Y.: Hibbard, Spencer, Bartlet & Co., Chicago: Simmons Hardware Co. St. Louis: Walbridge & Co. Buffalo, N. Y.: Carlin & Fulton, Baltimore, Md.: Burdett & Williams, Boston: Biddle Hardware Co. Philadelphia: A. Freeman, Chicago, and all the principal Hardware Dealers throughout the world.

Made in two sizes. Length of large one extended, 19in. closed 12in. small one opened 14in closed 9in. Blade 1-4 and 5-16in.

Owned and Manufactured by DECATUR COFFIN CO., Decatur, Ill. No. 1 $1 25 No. 2 $1.50

Samuel Martin,
MANUFACTURER OF
Theatrical Hardware,
127 Eighth Avenue, New York.



(Patented Dec. 28, 1886.)

HOTCHKISS IMPROVED RAT KILLER

MANUFACTURED BY
E. S. HOTCHKISS,
BRIDGEPORT, CONN.

Absolutely Free from Danger in Setting.

Cut Shows Trap BEING SET.

Send for Illustrated List.
Sample by Mail for 25 Cents.

CLOSES ON OUTSIDE OF NOSE.
Only Double Ring Invented.

Champion Hog Ringer
RINGS and HOLDER.
The only Ring that will effectually keep Hogs from rooting. No sharp points in the nose.

Only single Ring ever invented that closes on outside of the nose.
BROWN'S
Elliptical Ring
and Triple Groove Hog and Pig Ringer
Only single Ring that *closes on the outside of the nose.* No sharp points in the flesh to keep it sore.

CHAMBERS, BERING & QUINLAN CO., Exclusive Manufacturers, Decatur, Ill

Adamant Powder.

A new and unexcelled invention for hardening metals and especially Iron and Steel of all kinds.

Iron and Steel made nearly Impenetrable.

Patented lately and in use in Germany, England, Belgium and patent applied for in U. S.

We are introducing the Adamant Powder in this country and have no doubt that this article, which is easily applied and produces a nearly *impenetrable* metal, will quickly gain favor with all who use it.

We have two kinds of powder:
1. For hardening tools and very small articles within 8-10 minutes in open fire.
2. For hardening larger objects in iron boxes.

Adamant Powder Co.,
174-176 Pearl St., N. Y.
Sole Agents for U. S. and Canada.

CHAMPION IRON FENCE CO.,

KENTON, OHIO.

Largest Iron Fence and Railing Works in U. S.

SPECIALTIES—Iron Stairs and Jail Work, Builders' and Ornamental Iron Work, and the only manufacturers of Malleable Iron Cresting, guaranteed against breakage; also manufacturers of the Celebrated Ohio Champion Iron Force and Lift Pumps. Send for 150-page Catalogue.

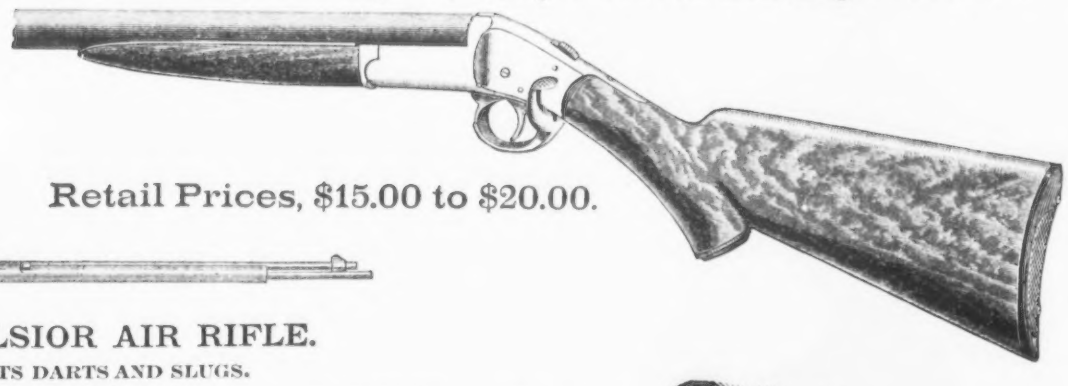
Top Snap "Champion," Single Breech-Loading Shot Gun.

Retail Prices, $15.00 to $20.00.

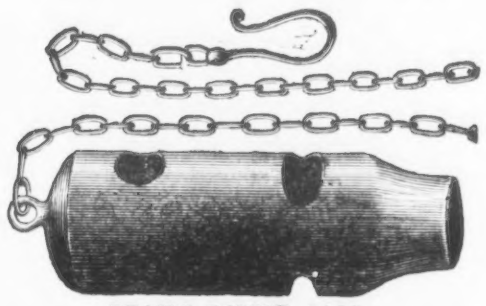
BEAN'S IMPROVED CHAIN TWISTERS.
PATENTED MAY 6, 1884.
WEIGHT, 3 OZS. RETAIL PRICE, $1.00.

IVER JOHNSON, 38 Cal., C. F., Shell Ejector Revolver.
Retail Price, $7.50.

Hammerless "Champion," Single Breech-Loading Shot Gun.



Retail Prices, $15.00 to $20.00.



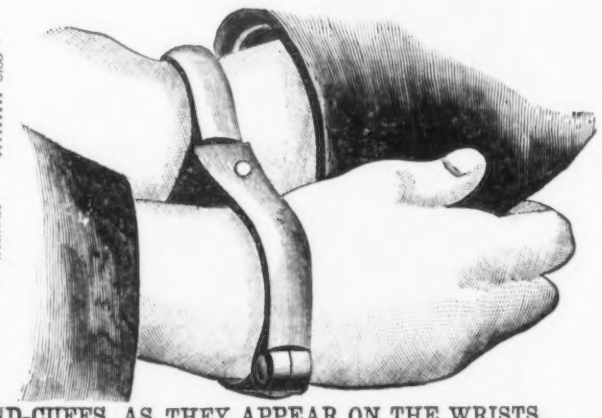
BEAN'S POLICE CALL.
PATENTED OCT. 23, 1881. RETAIL PRICE, $1.00.
This is the ONLY Call manufactured that is devoted exclusively to Police use.

EXCELSIOR AIR RIFLE.
SHOOTS DARTS AND SLUGS.
Retail Price, $10.00.

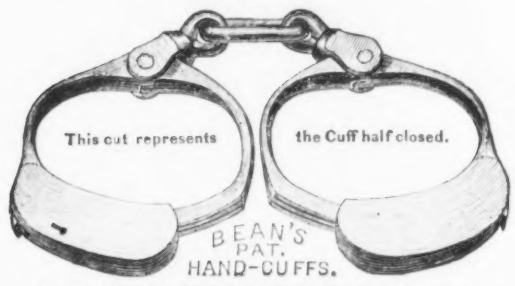
SIDE SNAP "CHAMPION"
Single Breech-Loading Shot Gun.
Retail Prices, $13.00 to $17.00.

PATENT APPLIED FOR.

PRICE, Plated, with Pocket.....$6.50
" " without " 6.00
Weight, 10½ ounces.



GIANT HAND-CUFFS, AS THEY APPEAR ON THE WRISTS.
Impossible for the Prisoner to remove them from his wrist either with or without the key.



No. 1, Or PATROLMAN'S HAND-CUFFS.
PATENTED NOV. 28, 1882.
Weight, 14 ozs.
RETAIL PRICE, Nickel Plated, $4.75. Polished, $4.00.

JOHN P. LOVELL'S SONS,

Manufacturers of Champion Single Guns, Double and Single Action Revolvers, Air Rifles, Air Pistols, Bean's Police Goods.

AGENTS FOR THE SPRINGFIELD ROADSTER BICYCLE. **BOSTON, MASS., U. S. A.**

For Sale by all the leading Gun and Hardware Houses throughout the United States and Canada.

AMERICAN IRON AND STEEL WORKS.

JONES & LAUGHLINS

(LIMITED),

Lake and Canal Streets, Chicago,

—MANUFACTURERS OF—

STEEL NAILS,

MERCHANT BAR, BAND, HOOP AND SHEET IRON CHAINS

SPIKES, BOLTS, RIVETS

BESSEMER STEEL,

BEAMS, CHANNELS, ANGLES, TEES, PLATES, &c.,

COLD ROLLED SHAFTING.

WORKS AT PITTSBURGH, PA.

S. & C. WARDLOW SHEFFIELD, ENGLAND,

MANUFACTURERS OF THE CELEBRATED

Cast and Double Shear Steel

In Bars Sheets and Coils, for fine Pen and Pocket Cutlery, Razors, Table Knives, Mining Tools, Dies, Files, Clock, Watch and other Springs, and Sole Makers of the Special Brand "Tough" Cast Steel for Turning and other Tools.

OFFICES AND WAREHOUSE, 5 JOHN STREET, NEW YORK. **FRANK S. PILDITCH, Agent.**

W. W. SCRANTON *President.* WALTER SCRANTON *Vice-President.* E. P. KINGSBURY, *Sec'y and Treas.*

THE SCRANTON STEEL COMPANY,

MANUFACTURERS OF

Steel Rails and Billets.

Works at SCRANTON, PA. NEW YORK OFFICE 47 BROADWAY.

JESSOP'S STEEL

91 John St., NEW YORK.

BESSEMER AND OPEN-HEARTH

BLOOMS, BILLETS AND SLABS.

H. E. COLLINS & CO., 34 Lewis Block, Pittsburgh, Pa.

SMITH BROS., & CO.,

LA BELLE STEEL WORKS,

Ridge Ave. and Belmont St., Allegheny City, Pa.

Post Office Address, Pittsburgh, Pa. MANUFACTURERS OF ALL KINDS OF

STEEL

SPRINGS, AXLES, RAKE TEETH, ETC.

WETHERELL BROS., Eastern Representatives, 31 Oliver St., Boston, and 115 Liberty St., N. Y. C. E. JAMES & CO., Chattanooga, Tenn.

FRANCIS HOBSON & SON,

97 JOHN STREET, NEW YORK.

Sole Manufacturers of **"CHOICE"** *EXTRA CAST STEEL.*

MANUFACTURERS OF

Warranted Best Cast Steel

FOR TOOLS AND DIES, AND

CHOICE" EXTRA NEEDLE WIRE.

DON WORKS, SHEFFIELD, ENGLAND.

CHAS. HUGILL, Agent.

NEWTON & SHIPMAN,

83 JOHN ST., NEW YORK.

GENERAL AGENTS FOR

STEEL "F. W. MOSS" AND "MOSS & GAMBLE'S" FILES.

R. MUSHET'S SPECIAL STEEL

FOR

LATHES, PLANERS, &c.,

Turns out at least DOUBLE WORK by increased speed and feed, and CUTS HARDER METALS than any other Steel. Neither hardening nor tempering required.

SOLE MAKERS

SAMUEL OSBORN & CO.

SHEFFIELD, ENGLAND.

Represented in the United States by

B M. JONES & CO.,

Nos. 11 and 13 Oliver Street, BOSTON

NAYLOR & CO.

99 John Street, New York.

Iron Ores, Bessemer Pig Iron,
Spiegeleisen, Ferromanganese
Ferrosilicium, Scrap Iron,
Steel and Iron Wire Rods,
Norway Bars and Shapes,
Scrap Steel, Rail & Bloom Ends
Old Iron and Steel Rails,
Tin Plates, Pig Tin,
Spelter, Lead, Sheet Zinc,
Iron and Steel Beams,
Steel Rails, Tires & Axles,
Steel Blooms, Slabs, Bars, and Hoops.
Cotton Ties.

TRADE MARK.

JOHN WILSON'S BUTCHERS' KNIVES, BUTCHERS' STEELS, & SHOE KNIVES,

Have established and maintained their reputation, for superiority, against all Competitors, for

ONE HUNDRED AND THIRTY-SIX YEARS,

and are still in increasing demand. As in the past, it is the unalterable DETERMINATION OF THE HOUSE TO SEND OUT NOTHING BUT WHAT IS OF THE HIGHEST POSSIBLE QUALITY.

Works. SYCAMORE STREET, SHEFFIELD, ENGLAND.

Wilson Hawksworth, Ellison & Co.,

CARLISLE WORKS, *SHEFFIELD, ENGLAND.*

(ESTABLISHED 1825.)

CRUCIBLE STEEL AND STEEL WIRE.

WETHERELL BROS., Agents,

OLIVER STREET BOSTON. 115 LIBERTY STREET, NEW YORK.

THE STANDARD IRON COMPANY.

MANUFACTURERS OF

SHEET IRON AND SHEET STEEL,

COMMON OR SMOOTH FINISH.

CORRUGATED

ROOFING, CEILING AND SIDING,

STRAIGHT OR CURVED.

Bridgeport, - - - - Ohio.

MILD CRUCIBLE STEEL CASTINGS

FREE FROM BLOW HOLES.

On account of softness of metal but slight annealing is required to relieve stresses therefore hurried orders can be filled in three or four days after receipt of patterns. The material can be worked to machine, forged and welded without difficulty. Gears, Pinions, Cranks, Cams, Cross Heads, Rocker Arms and all descriptions of Machinery Castings manufactured by the

SYRACUSE STEEL FOUNDRY,

FRAZER & JONES CO., Proprietors,

SYRACUSE, - - N. Y.

THE MONTOUR IRON & STEEL COMPANY,

WORKS AT DANVILLE PA.

PIG IRON, T AND STREET RAILS,

Light Rails, 12 to 40 lbs. per yard.

RAIL JOINTS SPIKES AND BAR IRON.

W. E. C. COXE, President, Reading, Pa. T. F. McGINNES, Gen'l Supt., Danville, Pa.

STEEL

Gautier Steel.

SEE PAGE 3.

TROY STEEL AND IRON CO.,

TROY, N. Y., Manufacturers of

BESSEMER STEEL RAILS,

Fish Plates, Bolts, Nuts, Spikes, &c. Machinery Steel, Merchant and Ship Iron.

H. H. ROGERS. President, 26 Broadway, New York City.

CRESCENT STEEL

CRESCENT STEEL WORKS.

MILLER, METCALF & PARKIN.

480 PEARL ST. NEW YORK. PITTSBURGH, PA. 64 & 66 S. CLINTON ST. CHICAGO

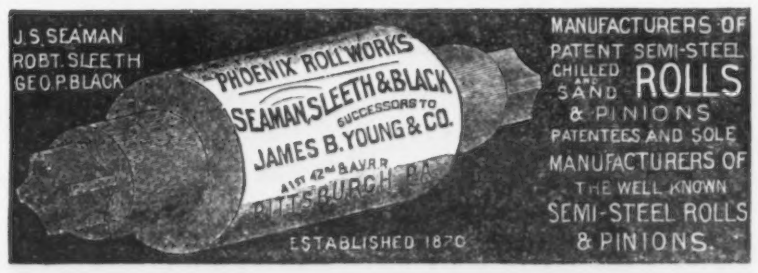
JOLIET STEEL COMPANY,

MANUFACTURERS OF

BESSEMER STEEL RAILS

OF ALL WEIGHTS.

A. J. LEITH, President, 11 Pine St. New York. H. S. SMITH, General Supt., Joliet, Ill.
Home Insurance Building, Chicago, W. R. STIRLING, Treas. J. C. STIRLING, Secy.



STEEL RAILS

T AND STREET.

Open Hearth and Bessemer

STEEL.

Blooms, Slabs and Billets

ROLLED AND HAMMERED

For Boiler, Ship & Tank Plate, Structural Purposes, Nails, Wire, Etc.

MACHINERY STEEL,

Rounds, Squares and Flats.

STEEL SHAFTING,

Hammered and Rolled.

Pennsylvania Steel Co.,

STEELTON, PA.

Gen'l Office, 208 South 4th St., Philadelphia, Pa.

STEEL FORGINGS

HEAVY AND LIGHT.

Rail Fastenings, Spikes, Etc.

Crossings, Frogs Switches.

Switch Stands of any required patterns.

Magnetic-Electro Signals

For Protection of Roads and Crossings.

Correspondence Solicited.

The Iron-Masters' LABORATORY.

Exclusively for the

Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.

No. 339 Walnut St., Philadelphia.

With Branch at Warrenton, Virginia.

J. BLODGET BRITTON.

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes, the object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

THE BOLTON STEEL CO.,

CANTON, OHIO,

MANUFACTURERS OF BEST REFINED

TOOL STEEL

And other Fine Grades of

CAST STEEL.

WANTED TO BUY

IRON AND STEEL SCRAP,

Old Iron Rails,	Old Steel Rails,
No. 1 Wrought Scrap,	Leaf Springs,
No. 1 Cast Scrap,	Coil Springs,
Cast Borings,	Locomotive Tires,
Wrought Turnings,	Steel Car Axles,
Axle Turnings,	Wagon and Buggy Springs
Burnt Iron,	Steel Turnings,
Pipes, Tanks and Sheets,	Plow Steel,
Old Shafts,	Steel Wire Rope,
Iron Car Axles,	Saw Gummings,
Plow Points,	Tool Steel,
Stove Plate,	Crop Ends.

JAMES H. LOGAN,

PENN BUILDING, - PITTSBURGH, PA

EUREKA

SHOW CASE CO.,

JOS. MONK, Manager,

208 and 210 Lake St., Chicago.

Buy direct from us and save commissions

Write for Price List.

A. PARDEE, Hazleton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,

237 South Third Street,

PHILADELPHIA.

No. 111 Broadway, New York.

MINERS AND SHIPPERS OF

LEHIGH COALS

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.:

A. Pardee & Co., HAZLETON, CRANBURY SUGAR LOAF LATTIMER.
Pardee, Bro. & Co.,
Calvin Pardee & Co., HOLLYWOOD
Pardee, Sons & Co., MT. PLEASANT.

THOS. FIRTH & SONS, Lim'd,
SHEFFIELD.
CRUCIBLE CAST STEEL.

JERE ABBOTT & CO.,
Agents and Importers of
SWEDISH IRON,
35 Oliver St., Boston. 23 Cliff St., New York.

GUSTAF LUNDBERG,
AGENT FOR
N. M. HÖGLUND'S SONS & CO.,
OF STOCKHOLM,
Swedish & Norway Iron
38 KILBY STREET, BOSTON.

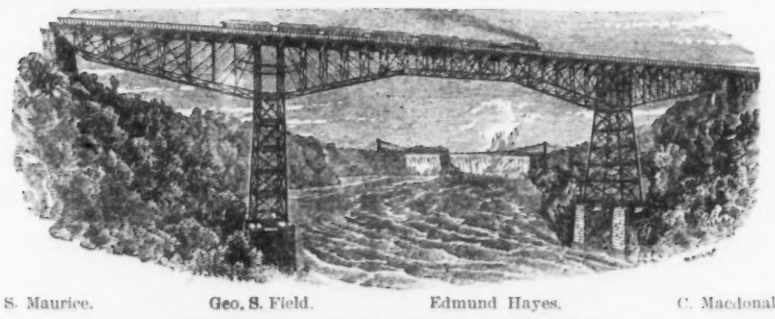
PAGE, NEWELL & CO.,
139 Milk Street, Boston.
IRON, STEEL AND METAL MERCHANTS,
IMPORTERS OF
SWEDISH IRON,
Including Charcoal, Siemens-Martin and Bessemer Productions, Bars, Shapes, Rods, Billets, Blooms.
DELIVERIES MADE AT ALL PROMINENT AMERICAN, CANADIAN AND PROVINCIAL PORTS.

SWEDISH IRON. CHARLES G. LUNDELL, *No. 7 Exchange Place,* BOSTON, - - MASS.

SWEDISH (NORWAY) IRON AND STEEL
LEWANDER & CO.
Agents for L. G. BRATT & CO., of Gothenberg, Sweden.
Main Office: 12 Post Office Square, Boston, Mass.

STEEL CASTINGS
From 1-4 to 15,000 lbs. WEIGHT.
True to Pattern, sound, solid, free from blow-holes and of unequaled strength.
Stronger and more durable than Iron forgings in any position or for any service whatever.
40,000 CRANK SHAFTS and 30,000 GEAR WHEELS of this steel now running to prove this.
Cross-Heads, Rockers, Piston-Heads, &c., for Locomotives.
STEEL CASTINGS of every description.
Send for Circulars and prices to
CHESTER STEEL CASTINGS CO.
Works, Chester, Pa. Office: 407 Library St., Phila., Pa.

UNION BRIDGE COMPANY.



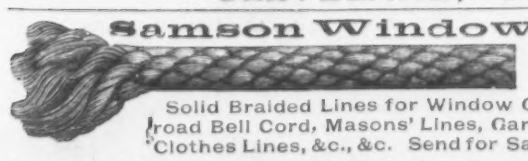
C. S. Maurice. Geo. S. Field. Edmund Hayes. C. Macdonald.
CIVIL ENGINEERS
And Constructors of Iron and Steel Bridges, Viaducts, Roofs, Elevated Railroads, Marine Piers, Etc.
Works: Athens, Pa. Capacity, 15,000 tons. Works: Buffalo, N. Y. Capacity, 15,000 tons.
DESIGNS AND ESTIMATES WILL BE SENT ON APPLICATION TO
UNION BRIDGE COMPANY, 1 Broadway, New York.

MAP OF TRACT FOR SALE OR TO LEASE—1200 feet water front, 4000 feet depth, on line of the Lehigh Valley, the N. J. Central and the Pennsylvania Rail Roads; 30 feet depth of water in front of property; accessible from Sandy Hook and New York for largest Ocean Steamships. Next Lehigh Valley wharves at Perth Amboy, New Jersey. See advertisement on page 24.

WILLIAM T. MEREDITH, No. 48 Wall Street, New York.

ELECTRIC LIGHT.
BRUSH ELECTRIC CO.
CLEVELAND, OHIO.

Samson Window Cord.



Solid Braided Lines for Window Cord, Railroad Bell Cord, Masons' Lines, Garden Lines, Clothes Lines, &c., &c. Send for Samples.
J. P. TOLMAN & CO., 164 High St., Boston, Mass.

Iron and Steel Importers and Commission Merchants. CHAS. G. ECKSTEIN & CO., Steel Rails, Tires and Axles Wrought Iron Wheel Centers, Beams, &c.
CONSTRUCTION MATERIAL A SPECIALTY.
American Agents of THE JOHN COCKERILL CO., Seraing, Belgium. 32 Liberty St., New York.

ASBECK, OSTHAUS, EICKEN & CO.,
STEEL MANUFACTURERS,
HAGEN (WESTPHALIA),
Direct Attention to the following Specialties:

CRUCIBLE CAST TOOL STEEL, equal in quality and finish to the most noted and finest brands.
REFINED WELDING STEEL, in various qualities, and of any desired dimensions.
SHEET STEEL, for Springs, Knives, Saws, Shovels, and Agricultural Implements generally, made from Puddled Steel, Refined Steel, Martin's, and Crucible Cast Steel.
PATENT STEEL-FACED ARMOUR-PLATES, hardened on one side, and proof against any tool or implement, suitable for fire-proof and burglar-proof safes, and strong rooms.
MILAN or INDIAN STEEL, rolled or hammered.
SPRING STEEL, in all qualities, suitable for Vehicles and Railway Carriages.
SPIRAL SPRINGS for Railway Carriages.
CRUCIBLE CAST STEEL WIRE, **up to the finest qualities, rolled and drawn,** for Gun Springs, Engine Coils, Hand and Machine Sewing Needles, **Machine Knitting Needles,** Cards, Telephone Wires, as also for Mining and Steam Plough Cables from 100 to 200 Kilos, resisting strain per square millimetre. The last two kinds may be had **plain bright, or galvanized or lead coated.**

We may mention as a leading specialty of these Works our Patent Cast Steel Music Wire, for Pianoforte Strings, made of the best Swedish material and warranted.

B. KREISCHER & SONS,
FIRE BRICK.
BEST AND CHEAPEST.
ESTABLISHED 1845.
Office, foot of Houston Street, East River, NEW YORK.

NEWTON & CO.,
ALBANY, N. Y.,
MANUFACTURERS OF BEST QUALITY
FIRE BRICK
And STOVE LININGS.

M. D. VALENTINE & BRO.,
MANUFACTURERS OF
FIRE BRICK
And FURNACE BLOCKS.
DRAIN PIPE AND LAND TILE,
Woodbridge, N. J.

BORGNER & O'BRIEN,
MANUFACTURERS
FIRE BRICK
AND
Edge Pressed Furnace Blocks, Clay Retorts, Tiles, &c.
Twenty-third Street, Above Race, PHILADELPHIA.
Twenty years' practical experience.

ESTABLISHED 1848.
TROY FIRE BRICK WORKS,
Troy, N. Y.
James Ostrander & Son,
MANUFACTURERS OF
FIRE BRICK,
Tiles, Blast Furnace Blocks, &c., and in a *Special Department Linings for Stoves, Ranges and Heaters* of superior quality. Miners of and dealers in Woodbridge, N. J., Fire Clay and Fire Sand and Staten Island Kaolin.

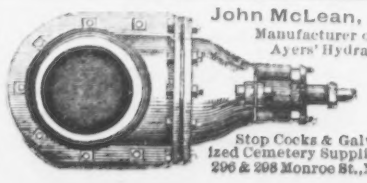
ESTABLISHED 1864.
JAMES GARDNER,
Successor to GARDNER BROS.,
MANUFACTURER OF
"STANDARD SAVAGE" FIRE BRICK, TILE & FURNACE BLOCKS,
OF ALL SHAPES AND SIZES
Miner and Shipper of "Mount Savage" Fire Clay.
WORKS, Ellersile, Allegheny Co., Md.
MAIN OFFICE, Cumberland, Md., P. O. Box 93.
BRANCH OFFICE, Pittsburgh, Pa., P. O. Box 373.
S. M. Hamilton & Co., Agents, Baltimore, Md.

UNION MINING COMPANY.
MOUNT SAVAGE FIRE BRICK.
Agent for Eastern Penna., West New Jersey and Delaware,
EDWARD J. ETTING,
222 South Third St., Philadelphia, Pa.

BIRMINGHAM FIRE BRICK WORKS.
All dimensions of *Firebricks and Shapes, Fire Clay for Furnaces, Coke Ovens, Boilers and Patent Grate Linings. Drain Tile, Street Paving Blocks and Fire-Proof Hollow Bricks for Buildings.*
BIRMINGHAM, ALA.

ESTABLISHED 1856.
HENRY MAURER & SON,
MANUFACTURERS OF
FIRE BRICK
of all Shapes and Sizes.
420 E. 23d St., New York.

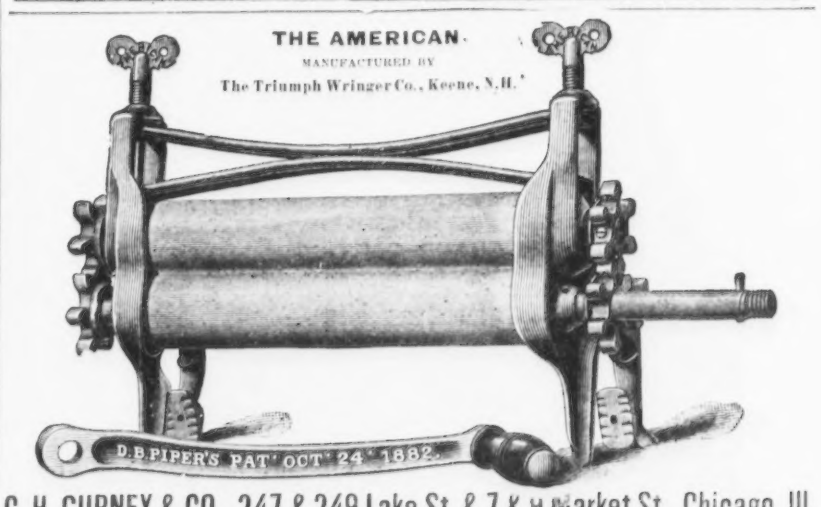
John McLean,
Manufacturer of Ayers' Hydrants.



Stop Cocks & Galvanized Cemetery Supplies.
296 & 298 Monroe St., N.Y.

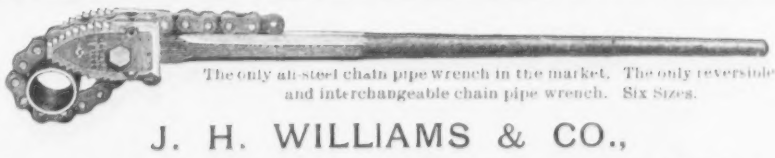
UDELL WOODEN-WARE WORKS,

INDIANAPOLIS, IND.
NEW YORK ADDRESS:
79 READE STREET,
Manufacturers of
Rope Reels, Broom Stands,
Step Ladders, Extension Ladders, Long Ladders, Clothes Bars, &c.
Largest line of Step Ladders in the World. Send for Catalogue.

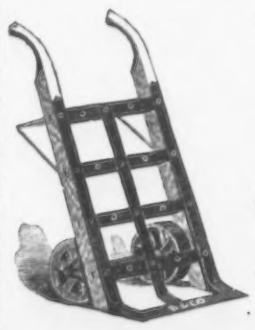


C. H. GURNEY & CO., 247 & 249 Lake St. & 7 & 9 Market St., Chicago, Ill.
AGENTS FOR THE NORTHWEST.

BROCK'S PATENT DROP FORGED CHAIN PIPE WRENCH.



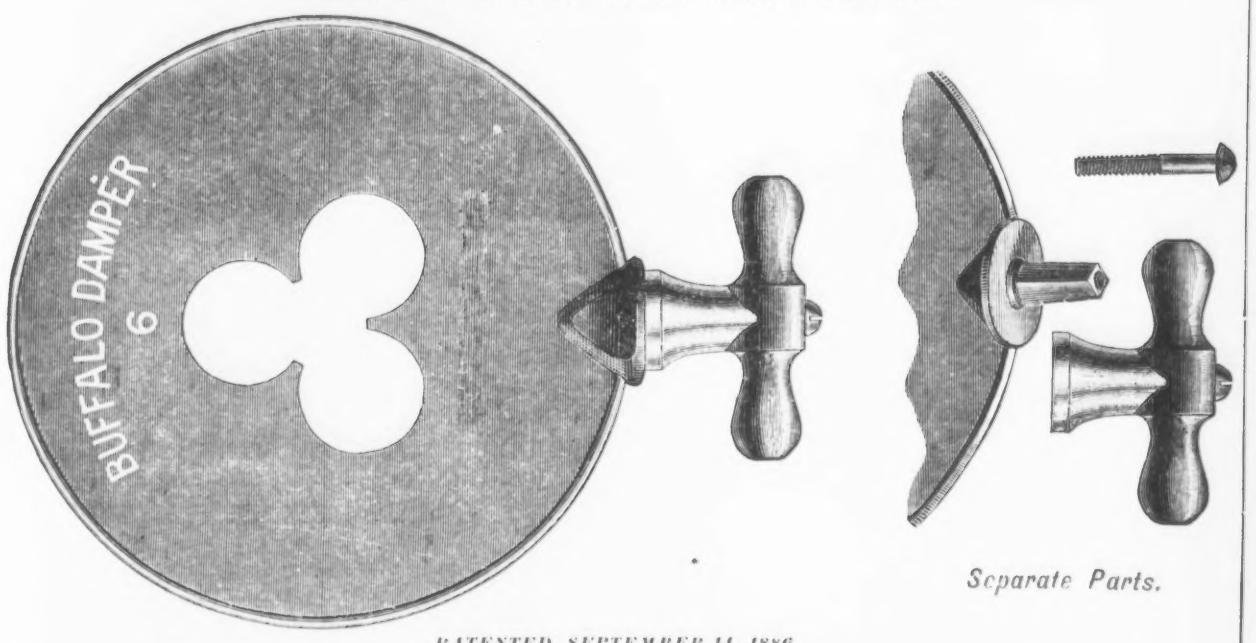
The only all-steel chain pipe wrench in the market. The only reversible and interchangeable chain pipe wrench. Six Sizes.
J. H. WILLIAMS & CO.,
Drop Forgings of Every Description,
9 RICHARDS STREET, BROOKLYN, N. Y.



BYRAM & COMPANY'S
STEEL NOSE STORE AND WAREHOUSE TRUCKS.
The most serviceable Truck for store, warehouse or railroad use will be found in the Steel Nose Truck manufactured exclusively by
BYRAM & COMPANY,
435 and 437 Guoin St., 46 and 48 Wight St.,
DETROIT, MICH
Correspondence Solicited and Satisfaction Guaranteed.

BUFFALO DAMPER,

With Black Enameled Wood Handle.



Separate Parts.

PATENTED, SEPTEMBER 14, 1886.

Single Bearing. *Four Pieces.* *No Springs.*

SIX SIZES, each, with Japanned and Nickel-Plated Shanks, 4, 4½, 5, 5½, 6 and 7 inches.

SIMPLEST, BEST AND MOST POPULAR DAMPER MADE.

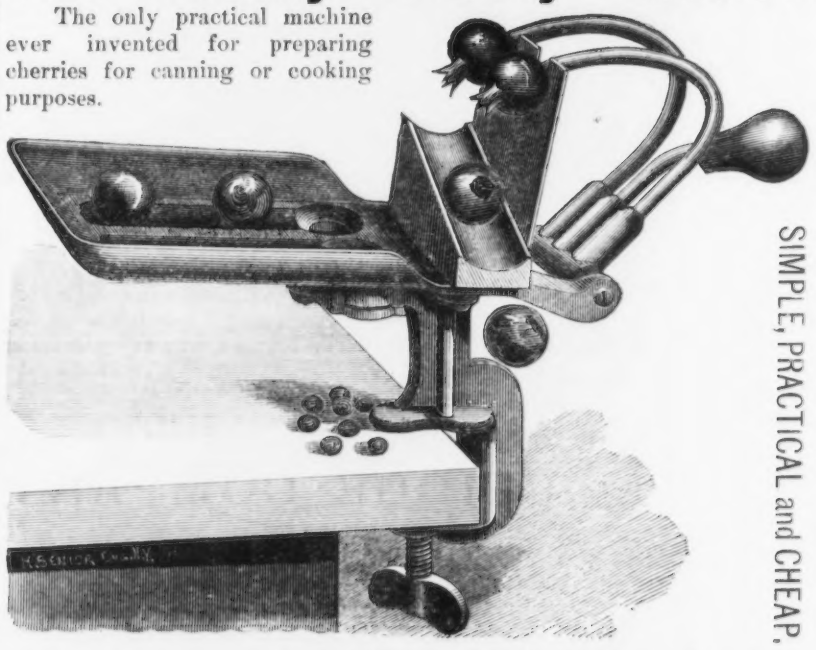
BUFFALO HOT-AIR DAMPER CLIPS FOR FURNACES. PRICES QUOTED ON APPLICATION.

SOLE MANUFACTURERS,

Sidney Shepard & Co., Buffalo, N. Y. **C. Sidney Shepard & Co., Chicago, Ill.**

The Family Cherry Stoner.

The only practical machine ever invented for preparing cherries for canning or cooking purposes.



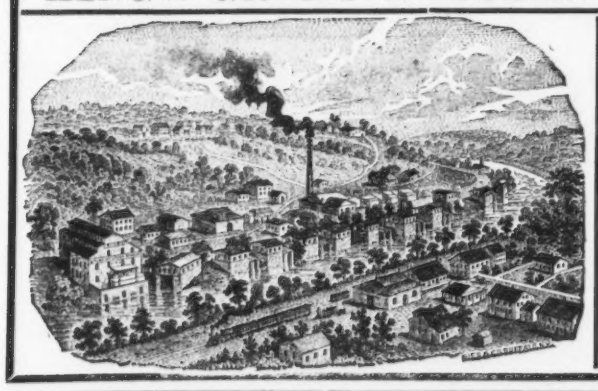
SIMPLE, PRACTICAL and CHEAP.

Removes the stone without mashing the fruit, which is left plump and round as before it was pitted.

For Sale by the Wholesale Hardware Trade Generally.

GOODELL COMPANY, Sole Manufacturers,
ANTRIM, N. H.

KING'S GREAT WESTERN POWDER CO., CINCINNATI, OHIO.



Manufacturers of the Celebrated

KING'S 'QUICK SHOT'

The Strongest, Cleanest and Quickest Trap and Wing Powder Made.

'ROYAL' RIFLE POWDER

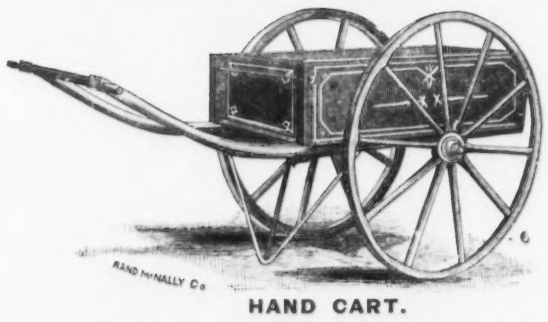
Always Strong, Clean and Reliable.

Mining and Blasting Powders

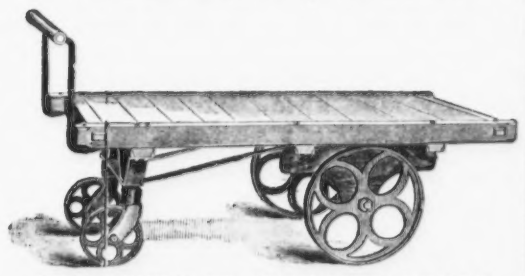
Send for the third edition of Handy Book for Trap Shooters and Sportsmen. SENT FREE.

LANSING WHEELBARROW CO.,

LANSING, MICH.

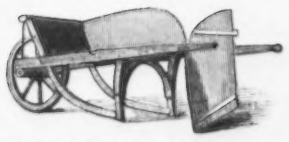


HAND CART.



THE REYNOLDS IMPROVED TRUCK.

Front Wheels Casters. Truck turns in its own length. Runs on or off elevator or scales at any angle. Is easily dumped by lifting handle. Any size. Send for circular.



Globe Patent Garden Barrow.

Capitol Patent Bolted Barrow.

Send for Catalogue.

St. Louis Stamping Co.,

ST. LOUIS, MO.,

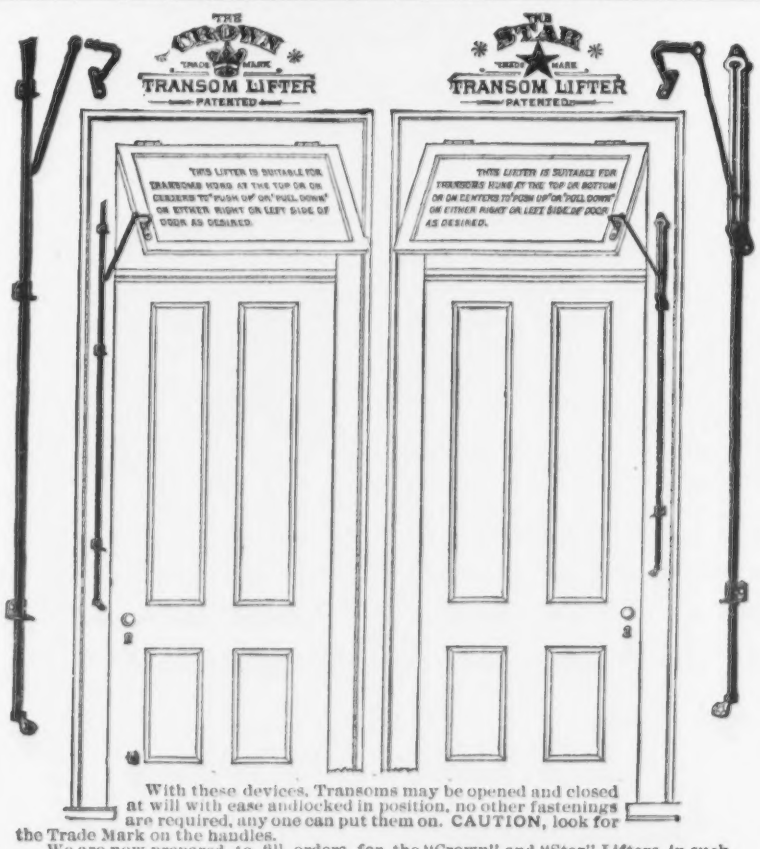
MANUFACTURERS

GRANITE IRONWARE

AND DRIPPING PANS,

Fine Black Sheet and Galvanized Iron.

BRANCH HOUSES, NEW YORK. CHICAGO.



With these devices, Transoms may be opened and closed at will with ease and locked in position, no other fastenings are required, any one can put them on. CAUTION, look for the Trade Mark on the handles.

We are now prepared to fill orders for the "Crown" and "Star" Lifters, in such sizes as are listed below, which are suitable for house and office transoms, and hope soon to announce our ability to supply sizes for store transoms.

Price List "Crown" Lifters.					LIST.	Price List "Star" Lifters.				
No	Length	Size of Rod.		Price Each.	APRIL 8th	No.	Length	Size of Rod.		Price Each.
43	3 feet	⅜ x ½	Bronzed Iron.	$0.55		83	3 feet	⅜ X ½	Bronzed Iron.	$0.70
44	4 "	"	" "	0.65	1886.	84	4 "	"	" "	0.80
45	5 "	"	" "	0.75		85	5 "	"	" "	0.90
43½	3 "	"	Nickel Plated.	1.75		83½	3 "	"	Nickel Plated.	2.00
44½	4 "	"	" "	2.00		84½	4 "	"	" "	2.25
45½	5 "	"	" "	2.25		85½	5 "	"	" "	2.50

ORDER BY NUMBER. *For Sale by J. F. WOLLENSAK, Chicago, Ill.*

FLORENCE OIL STOVES

ARE, LIKE FEW OTHER LUXURIES, A NECESSITY AND ARE THE BEST FOR ALL PURPOSES FOR SALE EVERYWHERE MADE BY FLORENCE MACHINE CO. FLORENCE, MASS.

New York Office, 27 Union Square.

JOHN ADT & SON,
—BUILDERS OF—
HARDWARE MANUFACTURING MACHINERY.
Send for Catalogue.
NEW HAVEN, CONN., U. S. A.

HP NAIL CO., CLEVELAND, O.

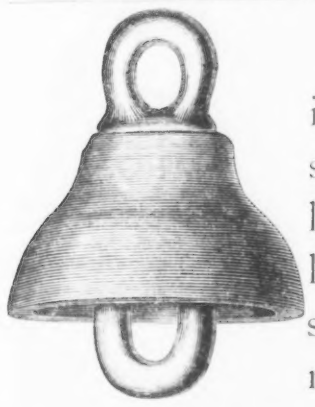
MANUFACTURERS OF

STANDARD PENNY NAILS.

BRADS OR FINISHING NAILS. CAR NAILS. CIGAR BOX NAILS. TIN AND SLATE ROOFING NAILS. WIRE SPIKES FOR TRACK AND DOCK WORK. WIRE TACKS. BLIND AND BED STAPLES AND LINKS. MCGREGOR NAIL BOXES, AND WIRE NAILS OF ALL KINDS, BARBED OR SMOOTH, PLAIN, TINNED OR GALVANIZED.

AGENTS:

C. McCARTY & CO., New York. I. WALES & CO., Boston. HEATON & DENCKLA HARDWARE CO., Philadelphia. HIBBARD, SPENCER BARTLETT & CO., Chicago. BEALS & BROWN, Buffalo. C. B. MELISH, Cincinnati, Ohio. HUNTINGTON, HOPKINS & CO., San Francisco. JNO. PRITZLAFF HARDWARE CO., Milwaukee.



THIS VALVE

is expanded by winding a strip of leather around the link under the rubber. The link and rubber are so constructed that the packing cannot get out.

A. WYCKOFF & SON,

ELMIRA, N. Y.

PATENT RUBBER VALVE FOR CHAIN PUMPS.

The BEST and Most Durable Expanding Valve on the Market.

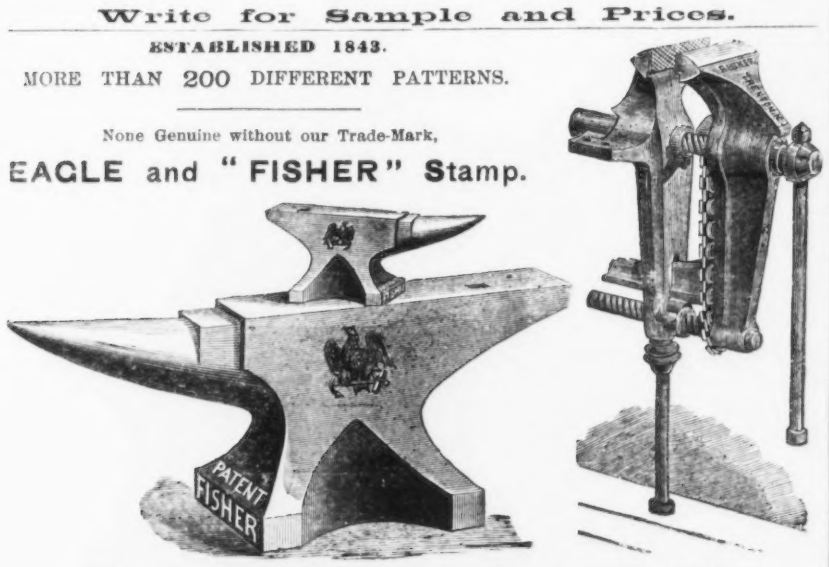
Write for Sample and Prices.

ESTABLISHED 1843.

MORE THAN 200 DIFFERENT PATTERNS.

None Genuine without our Trade-Mark,

EAGLE and "FISHER" Stamp.



WARRANTED BETTER THAN THE BEST ENGLISH ANVIL!

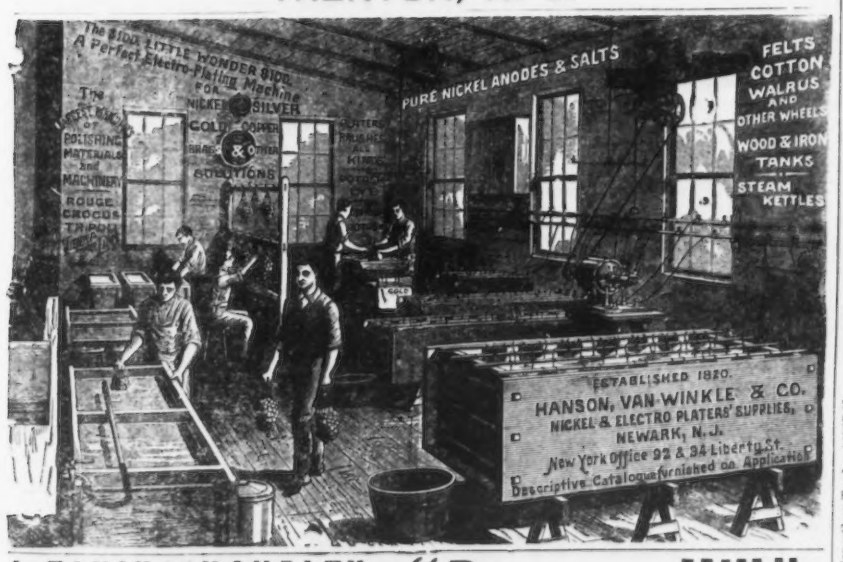
Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or "settle." Horn of tough *untempered steel*, never to break or bend. *Only Anvil made in United States fully warranted as above.*

FISHER DOUBLE-SCREW VISE

IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND DURABLE. Send for Circular.

EAGLE ANVIL WORKS,

TRENTON, N. J.



A TAKING NOVELTY. "Beacon Hill"

MOUSE TRAP

Always Baited. Sure to Catch.

SEND 10 CENTS FOR SAMPLE.

RIPLEY MFG. CO.,

UNIONVILLE CONN. U. S. A.

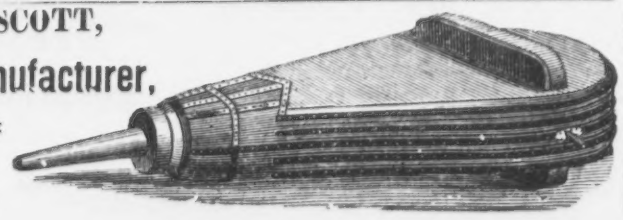
GEO. M. SCOTT,

Bellows Manufacturer,

Johnson Street

Cor. 22d St.,

CHICAGO, ILL.



EXPANDING

TAPS

From 3-4 in. to 10 in. Wrought-Iron Pipe Size.

SEND FOR PRICES.

WORSWICK MFG. CO.,

CLEVELAND, O.,

Manufacturers of

Malleable and Cast Iron Fittings and Brass Goods.

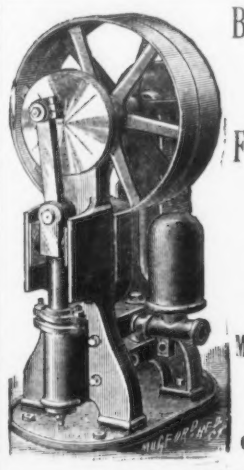
Jobbers of

Plumbers', Gas and Steam Fitters' Tools and Supplies.

Agents for

IRON PIPE AND BOILER TUBES

SEND FOR CATALOGUE.



BOILER AND TANK FEED POWER PUMP,

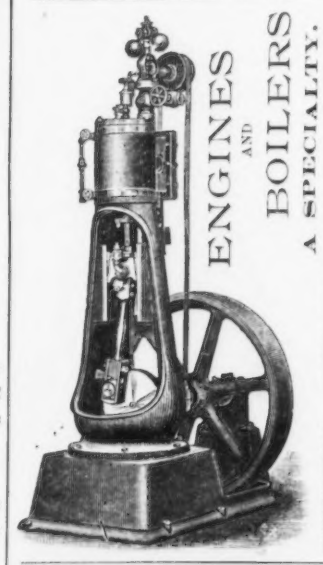
Manufactured by

The Shepard Manufacturing Co.

UNION CITY,

Connecticut.

Agents: A. ALLER, 109 Liberty St., N. Y. JARVIS ENGINEERING CO., 61 Oliver Street, Boston



ENGINES AND BOILERS

A SPECIALTY.

NEWELL UNIVERSAL MILL CO.,

10 Barclay Street, New York,

MANUFACTURERS' AGENTS.

Pulleys, Hangers, Shafts.

Very large stock always on hand. Prompt deliveries. Neat designs, well proportioned. Will send an illustrated list crammed with useful information free.

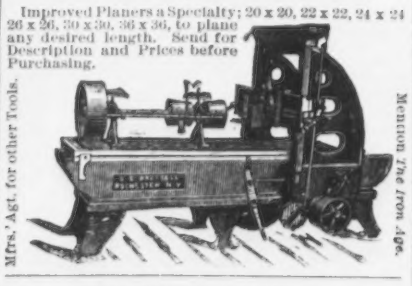
P. Pryibil, 467 W. 40th St., N. Y.

Brass and Wood-Working Machines.

G. E. BRETTELL.

Water Street, Rochester, N. Y.

Improved Planers a Specialty; 20 x 20, 22 x 22, 24 x 24 26 x 26, 30 x 30, 36 x 36, to plane any desired length. Send for Description and Prices before Purchasing.



Mfrs.' Agt. for other Tools.

Mention *The Iron Age.*

THE BEST AND CHEAPEST

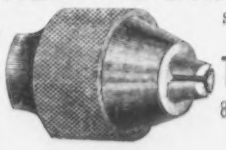
WIRE NAIL

MACHINE,

Tack and Nail Machinery.

Wm A. SWEETSER. Brockton, Mass (39 Montello Street.)

ALMOND DRILL CHUCK



Sold at all Machinists' Supply Stores.

T. R. ALMOND

83 & 85 Washington St.,

BROOKLYN, N. Y

THOMAS WOOD & CO.

Twenty-second and Wood Streets, Philadelphia, Pa.

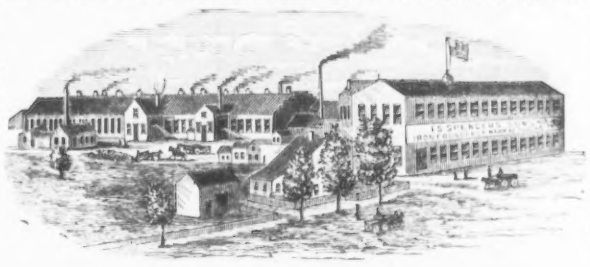
Shafting, Gearing, Self-Oiling Bearings, Friction Pulleys, Elevators.

Looms, Cotton and Woolen Machinery for Winding, Spooling, Reeling, Beaming, Warping, Dyeing, Sizing, Scouring, &c.

I. S. SPENCER'S SONS,

IRON AND BRASS FOUNDERS AND MANUFACTURERS.

Light and medium weight **GRAY IRON CASTINGS** of Best Material and Workmanship a specialty.



Sound and smooth Brass, Bronze, Composition and *Soft Metal Castings.*

ESTABLISHED 1857.

All kinds of light machine work, patented articles, fancy and light hardware, and wood and metal patterns made from samples or drawings. Japanning and Nickel, Bronze, Brass and Copper Plating a specialty. Extra facilities for annealing. Full capacity, 12 tons per day. *Correspondence or Interview Solicited.*

GUILFORD, CONN.

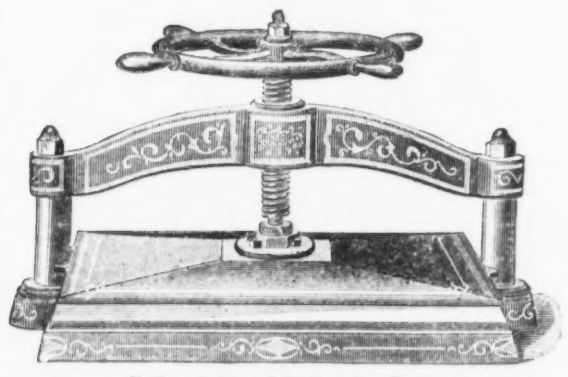
COPYING PRESSES

MANUFACTURED BY THE

ILLINOIS IRON AND BOLT CO.,

20 to 26 Main St., CARPENTERSVILLE, KANE CO., ILL.

ILLUSTRATED CATALOGUE AND DISCOUNT SENT TO THE TRADE UPON APPLICATION.



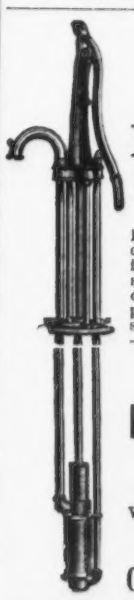
ILLUSTRATED CATALOGUE AND DISCOUNT SENT TO THE TRADE UPON APPLICATION.

Railroad Way-Bill Copying Press.

STEEL ARCH, with WHEEL or LEVER,

NICKEL-PLATED PILLARS, NUTS AND CAPS.

Finished in Carmine, Black and Gold.



NEW CHAMPION FORCE PUMP

HAS

Vacuum Chamber and Air Chamber,

Producing a continuous flow of water, both in suction and discharge. Works smoother and easier than any other force pump in the market. Has Seamless Drawn Brass Cylinders and no stuffing boxes. Never freezes in winter, and is not liable to get out of order. With Hose Attachment it is valuable as a fire protection, and for sprinkling lawns, gardens, &c. It is specially adapted for all kinds of wells—dug, drilled or driven—and for pumping water long distances from springs.

CLARK'S IMPROVED

Ratchet Stocks, Dies & Pipe Vises

FOR USE BY

Plumbers, Gas Fitters and Pump Dealers.

With the Ratchet Stock pipe can be threaded in a corner, down in wells, or in positions that would be inaccessible with other tools.

Send for Circulars and Price Lists to

CLARK BROTHERS, Mfrs., Belmont, N. Y., U. S. A

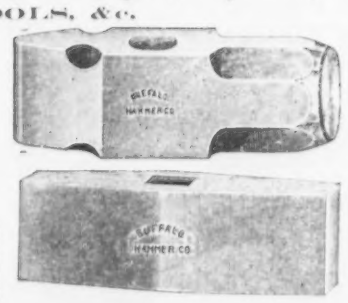
BUFFALO HAMMER COMPANY, Buffalo, N. Y., U.S.A.,

Manufacturers of a full line of

Solid Cast Steel Hammers, Sledges, Mauls,

R. R. TRACK TOOLS, &c.

Every Hammer or Tool having our name is fully warranted. Catalogues and discounts sent on application. Export orders will receive prompt and careful attention.



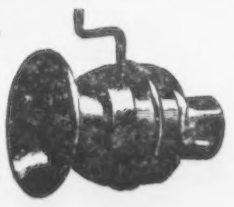
W. R. OSTRANDER & CO.,

21, 23 & 25 ANN STREET, NEW YORK,

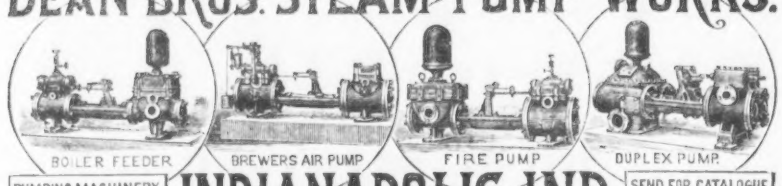
Manufacturers of

SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC, MECHANICAL & PNEUMATIC ANNUNCIATORS & BELLS.

Complete Outfits of Speaking Tubes, Whistles, Electric, Mechanical and Pneumatic Bells. A full line always in stock. Send for new catalogue. Factory, DeKalb ave., near Knickerbocker, Brooklyn, N.Y.



DEAN BROS. STEAM PUMP WORKS.



PUMPING MACHINERY FOR ALL PURPOSES. **INDIANAPOLIS, IND.** SEND FOR CATALOGUE AND PRICES.

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO. HARTFORD, CONN.

Issues Policies of Insurance after a careful Inspection of the Boilers.

COVERING ALL LOSS OR DAMAGE TO

BOILERS, BUILDINGS and MACHINERY,

ALSO COVERING LOSS OF LIFE AND INJURY TO PERSONS

ARISING FROM

STEAM BOILER EXPLOSIONS.

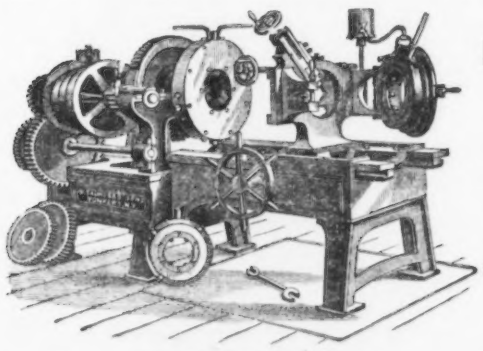
Full information concerning the plan of the Company's operations can be obtained at the COMPANY'S OFFICE, HARTFORD, CONN., or at any agency.

M. ALLEN Pres — W. B. FRANKLIN, Vice-Pres. — J. B. PIERCE, Sec

BOARD OF DIRECTORS:

J. M. ALLEN, President.
LUCIUS J. HENDEE, President Ætna Fire Ins. Co.
FRANK W. CHENEY, of Cheney Bros., Silk Manufrs., Hartford and New York.
CHARLES M. BEACH, of Beach & Company.
DANIEL PHILLIPS, of Adams Express Company.
EDMUND A. STEDMAN, Treasurer, Fidelity Co., Hartford.
RICHARD W. H. JARVIS, President Colt's Pat. Fire Arms Manufacturing Co.
THOMAS O. ENDERS, of the Ætna Life Insurance Co
LEVERETT BRAINARD, of the Case, Lockwood & Brainard Co.
GEN. WM. B. FRANKLIN, Vice-President Colt's Pat. Fire Arms Mfg. Co.
CLAPP SPOONER, N. E. Manager Adams Express Co., Bridgeport, Ct.
NEWTON CASE, of the Case, Lockwood & Brainard Co.
NELSON HOLLISTER, of the State Bank, Hartford.
CHAS. T. PARRY, of Baldwin Locomotive Works, Philadelphia.
HON. HENRY C. ROBINSON, Attorney at Law, Hartford.

D. SAUNDERS' SONS,



MANUFACTURERS OF

Pipe Cutting and Threading Machines

For Pipe, Mill and Steam Fitters' Use.

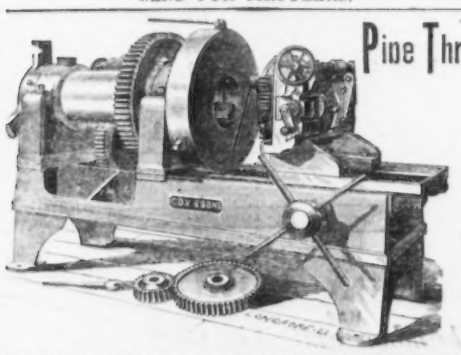
Tapping Machines

For Steam Fitting. Also

STEAM AND GAS FITTERS HAND TOOLS,

No. 25 Atherton Street,

SEND FOR CIRCULARS. YONKERS, N. Y.



Pipe Threading and Cutting Machines.

1-8 in. to 12 in. inclusive.

HAND-MACHINES.

1-8 in. to 2 in., inclusive.

PIPE FITTER'S TOOLS.

Solid, Cutter and Expanding Die

COX & SONS,

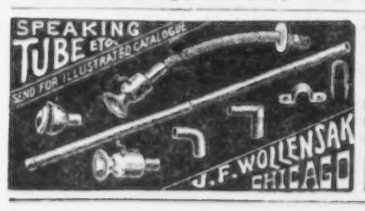
204 N. 4th St., Philadelphia, Pa.

THE WILMOT & HOBBS MFG. CO.

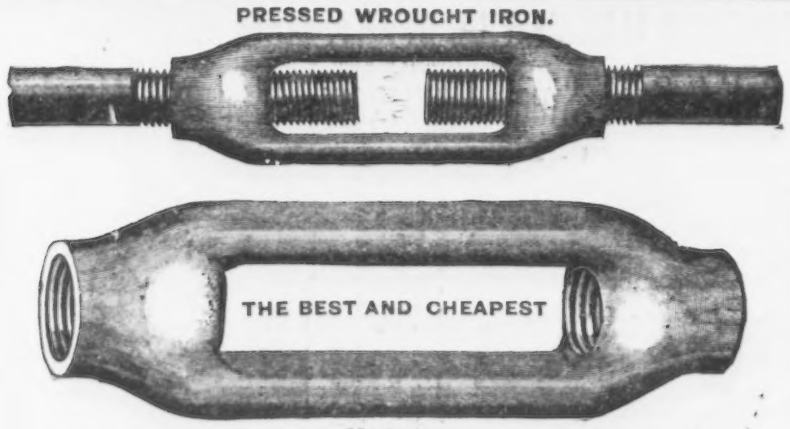
COLD ROLLED STEEL FOR PRESS & DROP WORK

IN VERY LONG COILS SUITABLE FOR FEEDING AUTOMATIC MACHINES ! LIGHT METALLIC GOODS MADE TO ORDER

BRIDGEPORT, CONN. U. S. A.



PRESSED WROUGHT IRON.



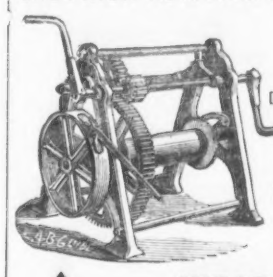
Made by

CLEVELAND CITY FORGE & IRON CO.,

Cleveland, Ohio.

Merrill Brothers, 26 First Street, BROOKLYN N. Y. **DROP** HAMMERS, FORGINGS and POWER PRESSES.

CAST IRON HOISTING CRAB WINCH,



SINGLE AND DOUBLE PURCHASE AND SIZES FROM 1-2 TON TO 24 TONS.

WESTON'S Ratchet Drills,

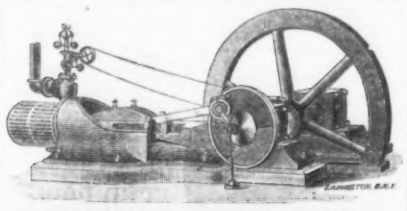
12 in. to 22 in. long.

Double pawl and ratchet, making most durable tool in the market.

Also Hydraulic Punching Bears, Rail Benders, Girder Testers, &c.

McCOY & SANDERS,

26 Warren Street, N. Y.



PORTER-HAMILTON, ROLLING MILL ENGINE.

Hamilton Blowing Engine

FOR BLAST FURNACES.

MOST SATISFACTORY IN USE.

Send for Catalogue.

WILLIAM TOD & CO., YOUNGSTOWN, OHIO.

Upright Power Hammer.

This Hammer possesses advantages superior to any other in the market. It has neither cylinders, valves nor piston rods, consequently it takes up less space, less power to drive it, strikes much harder and truer blows than hammers with double the weight of ram.

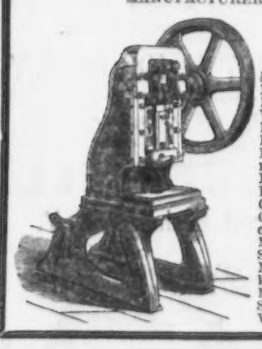
It can be worked to strike good alternate blows on a ¾-inch and ⅝-inch bar when a 100-pound hammer is used, and can be used on die work to a far greater advantage than any other hammer known. Manufactured by the

R. A. BELDEN COMPANY, Danbury, Conn.

The Waterbury Farrel Foundry and Machine Co.,

MANUFACTURERS,

WATERBURY, CONN.



Rolling Mills, Rivet and Bolt Machines, Patent Power Presses, Wire Mills, Drop Presses, Chilled Rolls, Spinning Lathes, Trimming Lathes, Foot Presses, Dies & Punches, Gang Slitters, Grinding Machines, Cartridge Machinery, Screw Threading Machines. All kinds of Special Machinery for Sheet Metal and Wire.

STEEL BALLS

—FOR—

Anti-Friction Bearings,

—OF—

BEST CAST STEEL,

Hardened, Ground and Burnished, 3-16 in. to 3 in. Diam.

Samples and Prices on Application.

SIMONDS ROLLING MACHINE CO. FITCHBURG, MASS.

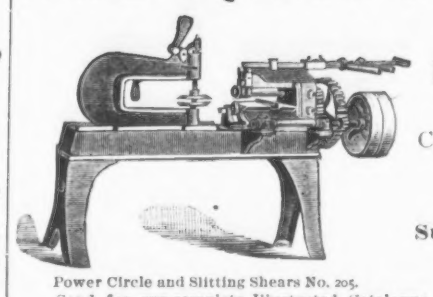
NIAGARA STAMPING AND TOOL CO.,

MANUFACTURERS OF

Machinery for Shearing Metal in all its Various Forms.

POWER SQUARING AND CIRCLE SHEARS,

POWER SLITTING SHEARS



Power Chopping Shears,

For Tack and Nail Plates, and for Cutting Steel for Cutlery Works.

OFFICE AND WORKS:

Superior, corner Randall Streets

BUFFALO, N. Y.

Power Circle and Slitting Shears No. 205.

Send for our complete Illustrated Catalogue and Price List, and mention this paper.

REGISTERED TRADE MARK — ELIAS HOWE JR. INVENTOR & MAKER NEW YORK U. S. A. — EMBEDDED IN THE MACHINE

THE NEW HOWE MFG. CO.,

BRIDGEPORT, CONN.,

Manufacturers of

SEWING MACHINES,

LIGHT AND MEDIUM WEIGHT

GRAY IRON CASTINGS

OF ALL DESCRIPTIONS TO ORDER.

Also Tool Making, Japanning and Plating.

CORRESPONDENCE SOLICITED.

LIGHT GRAY IRON CASTINGS

IS OUR SPECIALTY.

WE HAVE VERY GREAT CAPACITY, QUALITY EXCEPTIONAL

We have, in connection with our Foundries, machine shop for all kinds of light work.

Also Japanning and Nickel-Plating Works of our own.

CORRESPONDENCE SOLICITED.

The Taylor & Boggis Foundry Co.,

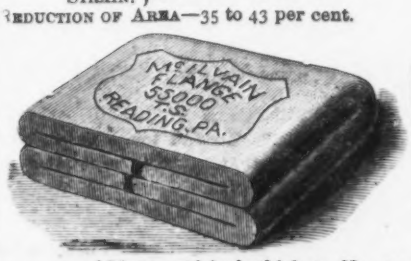
65 CENTRAL WAY, CLEVELAND, OHIO.

SEND FOR PRIC .

DROP FORGINGS.

WYMAN & GORDON, *Worcester, Mass.*

TENSILE STRAIN. { 56,000 to 64,000 lbs.
REDUCTION OF AREA—35 to 43 per cent.



CAPACITY. { Plates 1½ inch thick to No. 14. 30 feet long. 70 inches wide.

WM. McILVAIN & SONS,

MANUFACTURERS OF

BOILER PLATE

AND

CHARCOAL BLOOMS.

Locomotive, Fire Box, Flange and Shell Iron; Plate for Bridges and Girders; Tank and Stack Iron; Boat Plate and Iron for Wrought Pipe; Plate Iron for Fire and Burglar Proof Safes.

Waterbury Malleable Iron Co.,

WATERBURY, CONN.,

—MANUFACTURERS OF—

Cast and Malleable Iron Fittings

For Steam, Gas, Water and Oil.

Refined Malleable and Gray Iron

CASTINGS TO ORDER.

New York: Cor. Gold and Platt Sts.

San Francisco: 20 California St.

ESTABLISHED 1860

S. CHENEY & SON MANLIUS N. Y.

MANUFACTURERS OF LIGHT AND MEDIUM WEIGHT

GRAY IRON CASTINGS

OF ALL DESCRIPTIONS TO ORDER.

PATTERN MAKING & JAPANNING · CORRESPONDENCE SOLICITED.

SMALL GRAY IRON CASTINGS.

HAIGHT & CLARK,

Iron Founders, Albany, N. Y.,

MANUFACTURERS OF

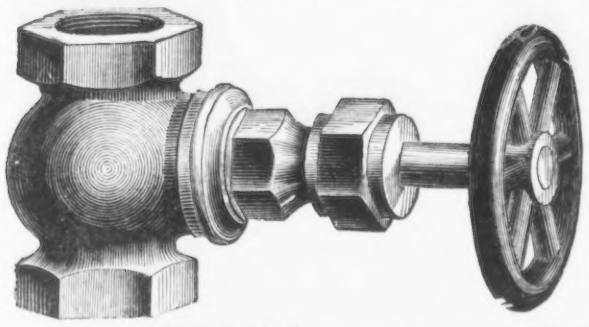
ORNAMENTAL AND ART CASTINGS, ROSETTES AND PICKETS FOR WIRE WORKER

Bases and Boots for Wire Forms, Piano and Organ Castings, Machinery Castings. Stove Patterns taken from the Wood. Correspondence invited for all kinds of Castings. Japanning, Nickel-Plating, Bronzing, in all their Branches. Send for Wire Workers' Catalogue.

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS AND VALVES



For Steam, Water, and Gas.

WROUGHT IRON PIPE & FITTINGS

Plumbers' Materials.

Factory: Paterson, N. J. 56 John Street, N. Y.

Our new Illustrated Catalogue and Price List is now ready, and will be sent to the Trade with their first order, or by express, if desired, before ordering.

WM. H. HASKELL, President. E. S. MASON, Treasurer. D. A. HUNT, Agent.

WM. H. HASKELL CO.,

MANUFACTURERS OF

GIMLET POINT

COACH SCREWS

Bolts, Cold-Punched Nuts & Washers,

SUITABLE FOR MACHINERY OF ALL KINDS.

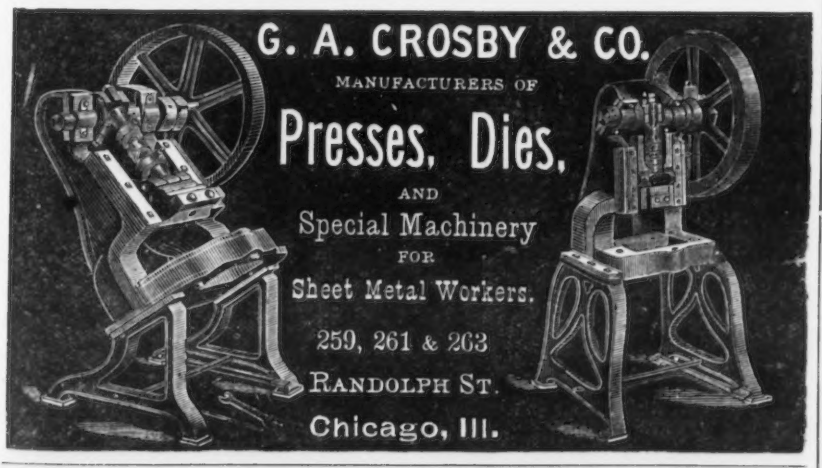
Office and Works: 277 Main St., PAWTUCKET, R. I., U. S. A.

HENRY B. NEWHALL CO., Agents,

105 Chambers St., New York. **47 Pearl St., Boston.**

G. A. CROSBY & CO.

MANUFACTURERS OF



Presses, Dies,

AND

Special Machinery

FOR

Sheet Metal Workers.

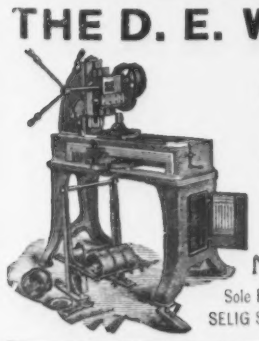
259, 261 & 263

RANDOLPH ST.

Chicago, Ill.

THE D. E. WHITON MACHINE CO.,

MANUFACTURERS OF



Gear Cutters, Centering Machines,

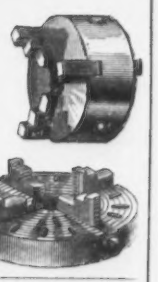
Lathe and Drill

CHUCKS

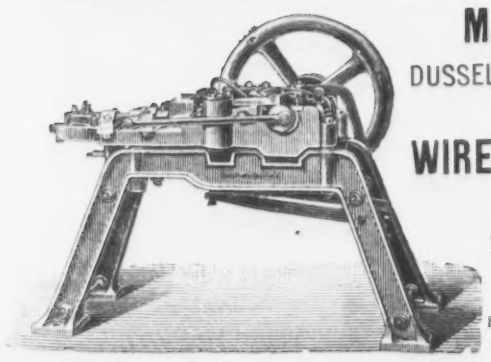
&c., &c.,

59 HOWARD STREET,

NEW LONDON, CONN.



Sole European Agents,
SELIG SONNENTHAL & CO., LONDON Send or Prices



Malmedie & Hiby,

DUSSELDORF-OBERBILK (Germany),

MANUFACTURERS OF

WIRE NAIL MACHINES.

L. HERNSHEIM,

16 and 18 Exchange Place, New York,

Sole Agent for the United States and Canada.

LIDGERWOOD'S HOISTING ENGINES,

ALSO

IMPROVED BOILERS.

SPECIALLY ADAPTED FOR

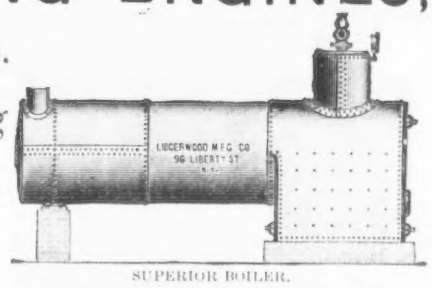
General Manufacturing

AND MINING PURPOSES,

CONTRACTORS, ELECTRIC LIGHTING, PILE DRIVING DOCK BUILDING, EXCAVATING, ETC.

300 STYLES AND SIZES.

NEW CATALOGUES NOW READY.



SUPERIOR BOILER.

LIDGERWOOD MFG. CO., 96 Liberty Street, New York

WORKS, BROOKLYN, N. Y.

ADAMANTINE SHOES, AND DIES FOR STAMP MILLS.

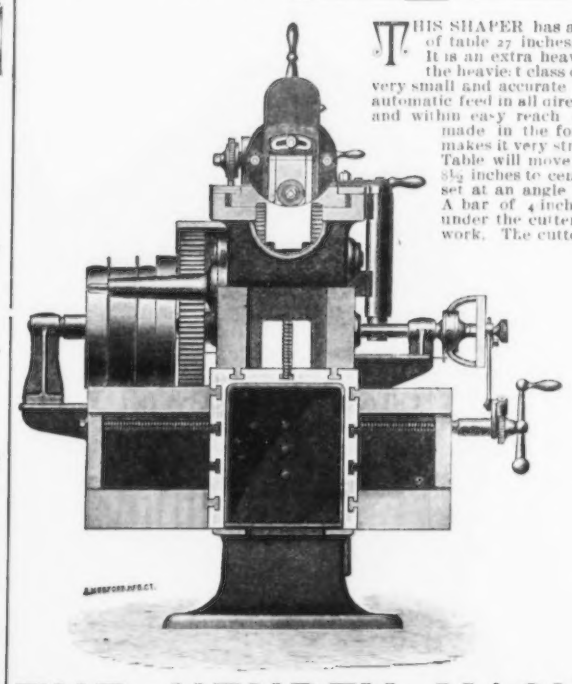
Recent improvements in material used and manner of casting have resulted in producing an article that will outwear from three to six of the ordinary iron goods. Also a Shoe and Die that will not "cup" or break at the shank. SEND FOR ILLUSTRATED CIRCULAR. ☞ When ordering, send rough sketch, with dimensions.

S. H. KOHN, President.
C. P. HAUGHIAN, Vice-President.

CHROME STEEL WORKS,

BROOKLYN, N. Y.

NEW 25-INCH SHAPER.



THIS SHAPER has a stroke of 25 inches, cross feed of table 27 inches, and will plane 20 inches high. It is an extra heavy machine, and is designed for the heaviest class of work, while at the same time very small and accurate work may be done on it. It has automatic feed in all directions, very simple in operation, and within easy reach of the operator. The table is made in the form of a four-sided box, which makes it very strong and solid under a heavy cut. Table will move to the left far enough to take in 8½ inches to center of machine, and tool can be set at an angle to plane 10 or 11 inches wide. A bar of 4 inch iron may be passed through under the cutter bar for key-seating or other work. The cutter bar is driven by two rack gears of large diameter, on a heavy steel shaft supported on bearings at each end. Driving pinion and gear are on the outside of the machine, allowing the use of extra large gear and increased speed of pulleys, and consequent gain of power on cutter bar. All pinions made of best machine steel.

Driving and feed shafts have extra outside bearings or supports.

The machine has patent improved friction driving movement, and we guarantee cutter bar to work up to a line and reverse without jar or noise.

Weight of Machine, 2700 pounds.

Size of Tight and Loose Pulleys on C. Shaft, 12 x 3.

Speed of Counter Shaft, 250 revolutions.

THE HENDEY MACHINE CO.,

TORRINGTON, CONN.

RICHARD DUDGEON,

No. 24 Columbia Street, New York.

Maker and Patentee of the Improved

Hydraulic Jacks

AND

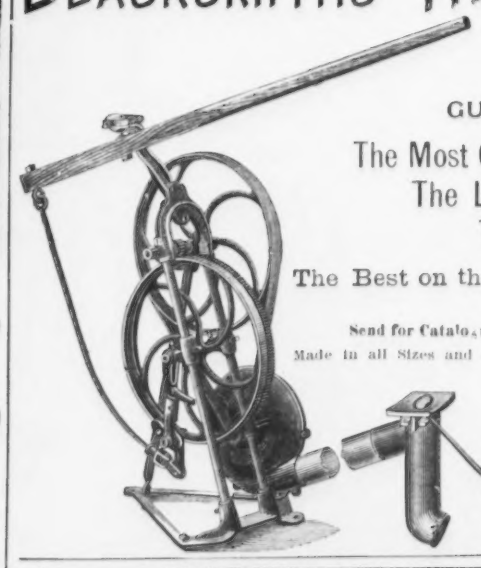
Punches.

Roller Tube Expanders and Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.
Jacks for pressing on Car Wheels or Crank Pins made to order.

THE SCIENTIFIC

BLACKSMITHS' HAND BLOWER.



ALL IRON.

GUARANTEED

The Most Compact,
The Lightest Running,
The Strongest Blast.

The Best on the Market, and is Practically Noiseless.

Send for Catalogue of these and our Portable Forges.

Made in all Sizes and Styles, and Guaranteed in every Respect.

THE

FOOS MANUFACTURING CO.,

SPRINGFIELD, OHIO.

BOILERS

MAHONING BOILER WORKS
ESTABLISHED 1863.
PIPES, STACKS, BEAMS, ROOF TRUSSES,
BLAST FURNACES & ROLLING MILL WORK.
W. B. POLLOCK & Co YOUNGSTOWN OHIO.

SHIELDS & BROWN,

78 and 80 Lake St., CHICAGO, ILL. 143 Worth St., NEW YORK.

MANUFACTURERS AND SOLE PROPRIETORS OF

FOR BOILERS AND STEAM PIPES. Reduces condensation of STEAM.

BRADLEY'S INSULATED AIR COVERINGS

Awarded first and only Prize, **Silver Medal,** at the late National Railway Exposition.

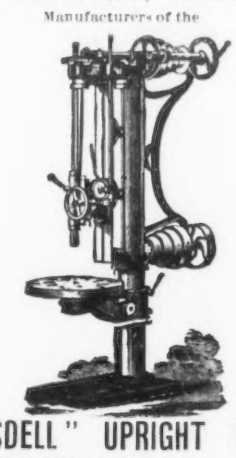
Send for Illustrated Pamphlet, and mention *The Iron Age.*

FOR GAS AND WATER PIPES. Prevents Sweating & Freezing.

P. BLAISDELL & CO.,

Worcester, Mass.,

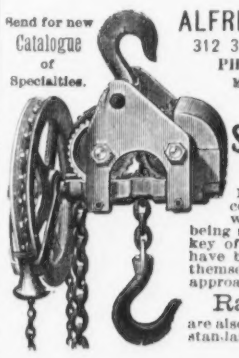
Manufacturers of the



"BLAISDELL" UPRIGHT DRILLS

AND OTHER FIRST-CLASS MACHINIST TOOLS.

Send for new Catalogue of Specialties.



ALFRED BOX & CO.

312 314, 316 Green St.,
PHILADELPHIA, PA.
Manufacturers of

Box's Pat. Double

Screw Hoists.

13,000 in use.

Many have done hard continuous duty 5 years without a single part being renewed. This is the key of our success. They have built up a reputation themselve that cannot be approached Our improved

Radial Drills

are also assuming the same standard.

THE BALLANTINE

PATENT

Automatic Grease Cup.

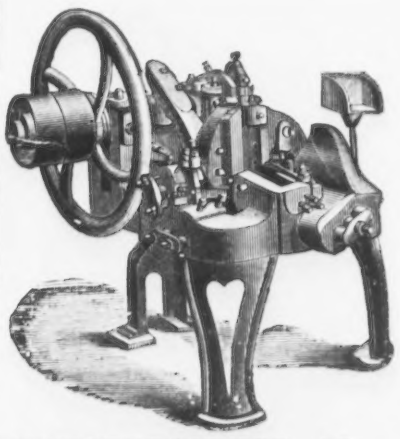
Inside Diameters of Cups, ¼, 1¼, 1½, 2, 2½, 3, 3½, 4 Inches.

Write for Price List and Discounts.

MANUFACTURED BY THE

WALKER MFG. CO.,

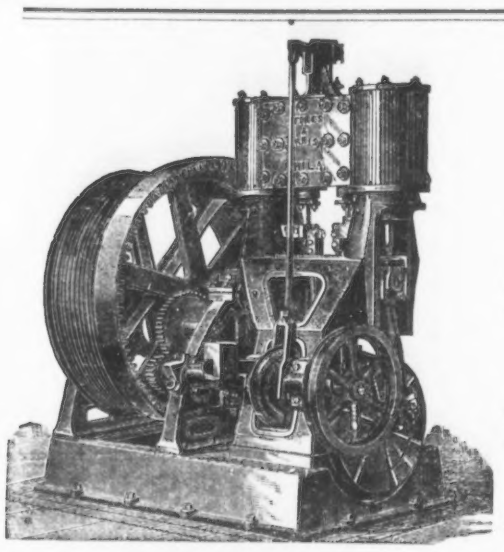
CLEVELAND, OHIO.



PITTSBURGH MFG. CO.,

Manufacturers of Nail and Spike Machines, Bolt Nuts, Washers Rivets, &c. Castings, Forgings and Blacksmith Work promptly attended to.

Office and Works: Railroad St., near 28th Pittsburgh, Pa



STOKES & PARRISH MACHINE CO.,
PHILADELPHIA.

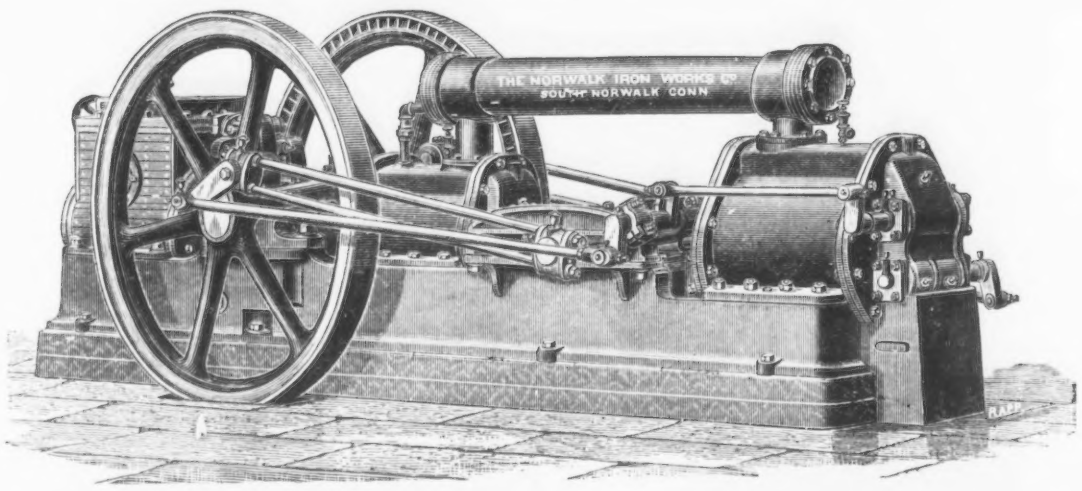
ELEVATORS,
Passenger and Freight, Steam Hydraulic and Belt Power.

Hoisting Machinery
For Mines, Dock Use and Inclined Planes. All kinds of Hoisting Machinery a Specialty.

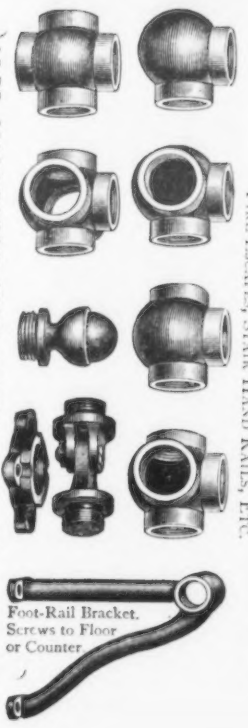
BLAST FURNACE
Hoisting Engines,
With Vertical or Horizontal Cylinders, for Handling Stock to Top of Stack with One or Two Platforms.

WORKS AND OFFICE,
3001 Chestnut St., Philadelphia.
NEW YORK OFFICE,
95 and 97 Liberty Street.

Air Compressors.



THE NORWALK IRON WORKS CO., South Norwalk, Conn.



MALLEABLE IRON, PIPE RAILING FITTINGS.
FOR FENCES, ENCLOSING ENGINES AND MACHINERY, EXHIBITION SPACES, FIRE ESCAPES, STAIR HAND RAILS, ETC.

ALSO, MALLEABLE IRON AWNING FRAME FITTINGS.
SEND FOR PRICE LIST TO
PANCOAST & MAULE Philadelphia Pa.

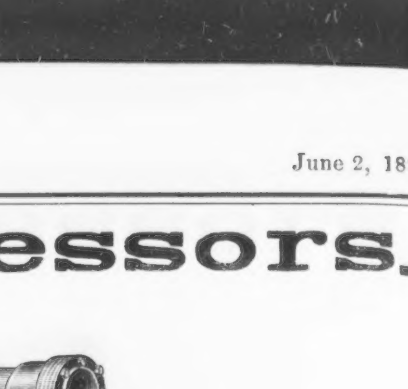
IMPROVED
Steam Glue Heaters,

For Pattern Makers, Cabinet Makers, Joiners, Bookbinders, Car Builders, &c. Has no Joints to leak, and is furnished with Enameled Iron Pots which will not discolor Glue or Paste.

For Price-List of fifteen different sizes, address
PANCOAST & MAULE,
PHILADELPHIA.

THE STANDARD TOOL CO.,

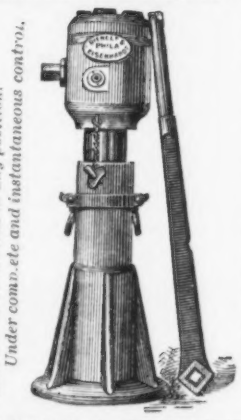
CLEVELAND, OHIO,
Manufacturers of
INCREASE TWIST DRILLS, &c.,
TAPER SHANK DRILLS,
Straight Shank Drills,
Machine Bit Drills,
Screw Driver Bits
BIT STOCK
Drills
SOCKETS,
Hand and
Shell Reamers,
Standard Gauges, Milling
Cutters and Special Tools,
Morse Taper Reamers,
— Standard Patent —
TWIST DRILL GRINDING MACHINE.
New York Office, 33 Chambers Street.



Established in 1874.
Cleveland Twist Drill Co.,
SEELEY, CHURCH & CO., 315 California St., San Francisco.
24 and 26 West Street, Cleveland, O
101 Chambers Street, New York.
85 Queen Victoria St., London, Eng.
OTIS & BROWN, 154 Lake St., Chicago

RELIANCE HYDRAULIC JACKS

SUPERIOR TO ANY JACK NOW MADE.
Absolute in its actions in any position. Under complete and instantaneous control.



MADE IN FOUR SIZES,
10, 15, 20 and 30-ton capacity, to lift 12 or 18 inches. Broad Base or Ground Lift.

DIENELT & EISENHARDT
Makers,
1308 Howard Street, Philadelphia.

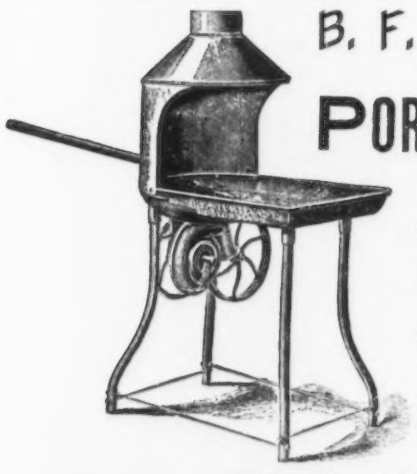
Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:
938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.

VALVES.

Double and Single Gate, ¼ in. to 48 in.—outside and inside Screws, Indicator, &c. for Gas Water, Steam and Oil. Yard and Wash Hydrants. Send for Circular. Also

FIRE HYDRANTS.



B. F. STURTEVANT'S
IMPROVED
PORTABLE FORGES,
NEW DESIGNS,
STRENGTH, CAPACITY, CONVENIENCE AND DURABILITY COMBINED.

ADAPTED TO ALL KINDS AND CLASSES OF WORK.

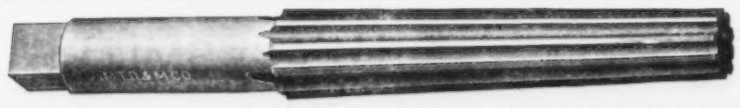
Sold for 25 per cent. less money than any other Forge of equal capacity and merit.

BUY NO OTHER.
ADDRESS:
B. F. STURTEVANT,
BOSTON, MASS.
WORKS: at Jamaica Plain.
SALESROOM: 115 Purchase Street, Boston, Mass.

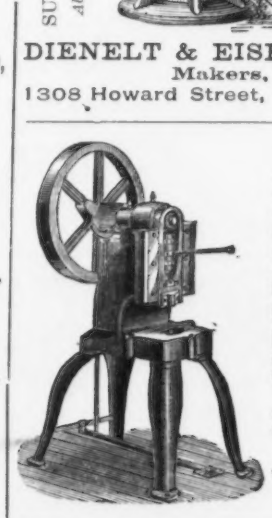
Morse Twist Drill & Machine Co., NEW BEDFORD, MASS.,

Manufacturers of *Morse Pat. Straight-Lip Increase Twist Drills,*

Bit Stock Drills, Solid and Shell Reamers, Drill Grinding Machines,
Milling *Cutters,*
Beach's Patent Self-Centering Chucks, and Special Tools to Order.



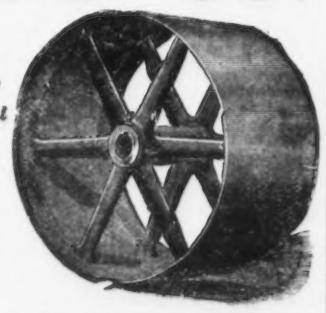
ALL TOOLS EXACT TO WHITWORTH STANDARD GAUGES.



A. H. MERRIMAN,
MERIDEN, CONN.,
Manufacturer of all Descriptions of
PRESSES.
Catalogue and prices sent on application.

WALKER MFG. CO.

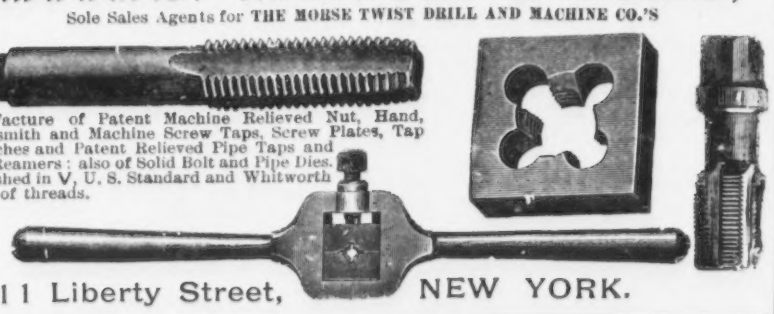
SHAFTING,
HANGERS,
PULLEYS.
Pulley Castings and Machine-Molded
GEARING
A SPECIALTY.
Cleveland, - Ohio.
Estimates furnished. Write Gear and Price Lists A.



MANNING, MAXWELL & MOORE,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

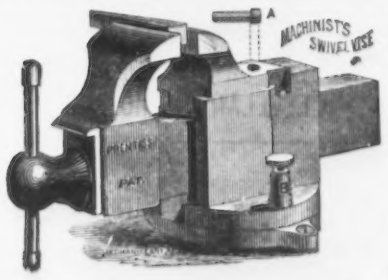
Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers; also of Solid Bolt and Pipe Dies. Furnished in V, U. S. Standard and Whitworth shape of threads.



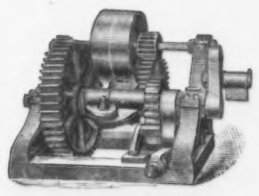
111 Liberty Street, NEW YORK.

WORKSHOPS
WITHOUT
STEAM POWER
SHOULD HAVE
BARNES'

Patent Foot Power Machinery. COMPLETE Outfits for actual workshop business. With them Builders, Cabinet Makers, Metal and Wood Workers compete with steam power. Machines **on trial** if desired.
Proof of value, prices, full detail, illustr'd catalogue, free.
W. F. & John Barnes Co.
Rockford, Ill.
Address No. 69 Ruby St.
Dealers send for discount sheet.



PRENTISS' PATENT VISES,
ADJUSTABLE JAW,
Stationary or Pat. Swivel Bottoms,
Adapted to all Kinds of Vise Work, also
"PEERLESS" SWIVEL PIPE GRIP,
FITS ANY VISE. SOLD BY THE TRADE.
PRENTISS VISE CO.,
23 Dey St., New York,
SOLE PROPRIETORS. SEND FOR CIRCULAR.



Peck Lifter.

PECK'S PAT. DROP PRESS
BLAST FORGES.
STEEL & IRON DROP FORGINGS,
Drop Dies and Special Machinery.
BEECHER & PECK, NEW HAVEN CONN.

JUST ISSUED.
—NEW—
Illustrated Catalogue
—BY—
E. E. GARVIN & CO.,
139, 143 Centre St., - NEW YORK.

MANUFACTURERS
Milling Machines,
Drill Presses,
Hand Lathes,
Profilers, &c.

SEND FOR ONE.

BUTTERFIELD & CO., MANUFACTURERS, DERBY LINE VT.

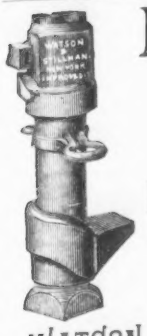
SEND FOR DISCOUNTS

FERRACUTE MACHINE CO.,
BRIDGETON, NEW JERSEY, U. S. A.,
Presses, Dies and all other Sheet Metal Tools.
Send for Illustrated Catalogue with sizes, weights and prices of 100 different kinds of Presses and Tools for
CANS, TINWARE, SILVER & BRASS GOODS, LOCKS, HARDWARE
and other Iron Goods. A new line of Punching Presses just out.

NEW PROCESS TWIST DRILL CO.,
MANUFACTURERS OF
Hot Forged Straight Lip Increase Twist Drills

Drills of any size or length, with Straight or Taper Shanks, made to order and to fit any socket desired.
SEND FOR CATALOGUE AND PRICE LIST.
TAUNTON, MASS.
JOS. F. CURREN, 106 Chambers St., New York, Sole Agent for New York and Vicinity.

Machinery, &c.



Hydrostatic Machinery,

JACKS, PRESSES,
PUNCHES, ACCUMULATORS,
PUMPS, VALVES, FITTINGS, &c.

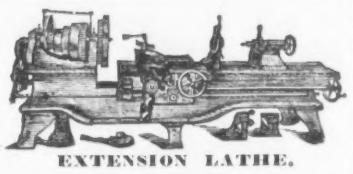
POLISHING AND BUFFING MACHINERY,
WOOD WHEELS, &c.,
Patent Punches and Shears.

WATSON & STILLMAN, 204, 206, 208 and 210 East 43d St.

Established 1867.

E. HARRINGTON, SON & CO.

Works and Office,
Cor. N. 15th St. & Penn. Ave.,
PHILADELPHIA PA., U. S. A.,
Manufacturers of a full line of



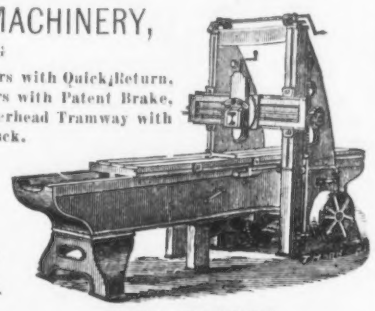
EXTENSION LATHE.

IRON-WORKING MACHINERY,
INCLUDING

Extension and Gap Lathes, Planers with Quick Return, Drills, &c., Hand Power Elevators with Patent Brake, Double Chain Screw Hoists, Overhead Tramway with Switch, Turntable and Geared Truck.

GEAR CUTTING A SPECIALTY.
Send for estimates.

REPRESENTED BY
J. Q. MAYNARD, 12 Cortlandt St., New York
C. E. KIMBALL, 93 Oliver St., Boston, Mass.
WARREN BUCHNER, 102 Main St., Cincinnati, Ohio.

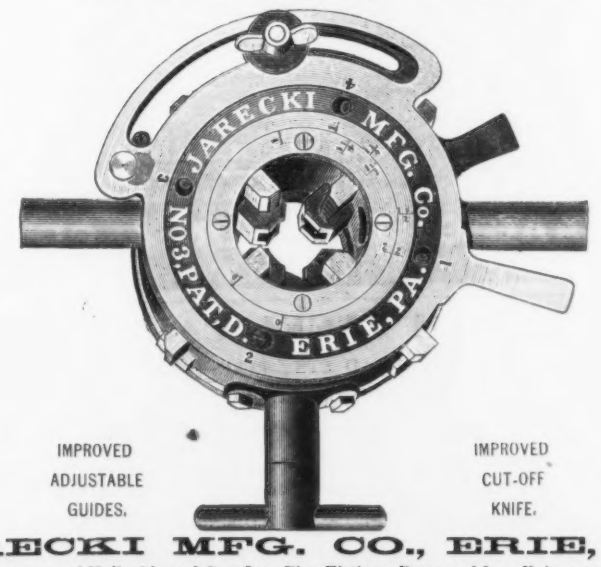


IRON PLANER.

Jarecki's Screw Plate and Pipe Cutter.

☞ WRITE FOR DISCOUNT AND DESCRIPTION.

No. 1 Cuts off and Threads ¼, ⅜, ½, ¾.....$14.00
No. 2 " " " " ⅜, ¾, 1, 1¼ 16.00
No. 3 " " " 1, 1¼, 1½, 2..... 20.00
No. 3½ " ½, ¾ 1, 1¼, 1½, 2... 22.50



No. 4A Cuts off and Threads ½ 2 2½, 3.....$35.00
No. 4B " " " 2½, 3, 3½, 4..... 50.00
No. 5 " " " 4½, 5, 6..... 75.00

IMPROVED ADJUSTABLE GUIDES.

IMPROVED CUT-OFF KNIFE.

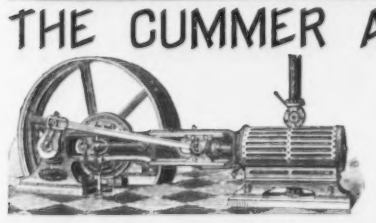
JARECKI MFG. CO., ERIE, PA.,

Manufacturers of Malleable and Cast Iron Pipe Fittings, Brass and Iron Valves and Cocks for Steam, Gas, Water and Oil; Pumps, Machinery and Supplies for Artesian Wells. ☞ Illustrated Catalogue on application.

THE ARMSTRONG M'F'G CO. BRIDGEPORT, CONN. WATER, GAS & STEAM FITTERS TOOLS

CATALOGUES AND PRICES SENT ON APPLICATION

THE CUMMER AUTOMATIC ENGINE



IS UNEQUALLED IN
Ease of Operation, Effective Duty, Close Regulation, Quick Starting Up to Speed, Uniformity of Speed and Economy of Fuel.

IT IS THE BEST ENGINE MADE.

☞ Printed matter, cuts and information promptly furnished on application. Send for our illustrated Catalogue

THE PROSPECT MACHINE & ENGINE CO.,
Formerly THE CUMMER ENGINE CO., Cleveland, Ohio.

FORBES & CURTIS, P. O. Box 1812. **Bridgeport, Conn., U. S. A.**

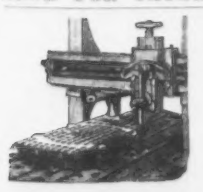
Manufacturers of

THE FORBES PAT. DYE STOCK,

PIPE CUTTING
—AND—
THREADING MACHINES
For Hand or Power,

CUTTING-OFF MACHINES.

SEND FOR CATALOGUE. *MENTION THIS PAPER.*



Radius Link Planer Attachment.

For Planing Links, Blocks and Circular Work, on ordinary Planer. Quickly Attached. Easily Operated. Does Accurate Work.

☞ CIRCULARS ON APPLICATION. ☜

PEDRICK & AYER, Philadelphia, Pa.

Machinery, &c.

CRANES FOR SALE.

Having substituted our

QUICK SPEED TRAVELING CRANE

for the SWING CRANES heretofore used in our Foundry, we desire to dispose of the latter without delay, and will therefore accept very low prices. These SWING CRANES were designed and constructed by ourselves for our own use. They have had good care, are in good condition, and were of the following capacities when new:

One 50 tons, operated by steam engine at base of frame.
One 50 tons, operated by hand.
Two 25 tons, operated by hand.
Three 10 tons, operated by hand.

Full particulars with prices will be given upon application.

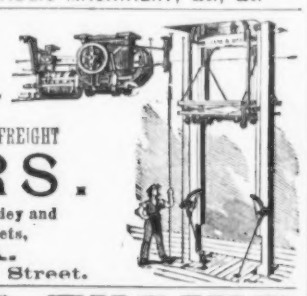
WM. SELLERS & CO., Incorporated,
PHILADELPHIA, PA.

SOUTHWARK FOUNDRY AND MACHINE CO.,

ENGINEERS AND MACHINISTS,
WASHINGTON AVE., and FIFTH ST., PHILADELPHIA, PA.

PORTER-ALLEN and SOUTHWARK ENGINES, BOILERS and TANKS,
BLOWING ENGINES, BESSEMER CONVERTERS, GAS APPARATUS,
SUGAR MACHINERY, HYDRAULIC MACHINERY, &c., &c.

MORSE ELEVATOR WORKS.



MORSE WILLIAMS & CO.
Successors to CLEM & MORSE),
Manufacturers and Builders of all kinds of PASSENGER and FREIGHT

ELEVATORS.

OFFICE: 411 Cherry Street. | WORKS: Frankford Ave., Wildey and Shackamaxon Streets,
PHILADELPHIA.
New York Office. 108 Liberty Street.

THE CLERK GAS ENGINE.

Highest Award for Gas Engines at American Institute Fair, New York, 1883.

Makes an ignition at every revolution of the Fly Wheel. Is started with ease, and gives full power immediately. No danger from fire; no extra insurance nor skilled engineer required. Runs perfectly steady; only uses gas when required. Workmanship of the best description and guaranteed. Indicated power considerably larger than in any other Gas Engine of the same size, each Engine giving from 1 H.-P. to 4 H.-P. more than named. Is unsurpassed by any other Gas Engine for running any kind of machinery or electric light, arc or incandescent. Has means for regulating to suit any coal or water gas.

No Boiler, Coal, Ashes or Engineer. Made in Sizes of 4, 8, 10, 15 and 25 H.-P.

THE CLERK GAS ENGINE CO., 1012-1016 Filbert St., Philadelphia.
Branch Offices: 142 Chambers St., New York; 4 West 14th St., New York; 76 Dearborn St., Chicago

Otto Gas Engine Agency

NEW YORK,

A. C. MANNING & CO. 47 Dey Street,

REMOVED ON MAY 1st,

TO

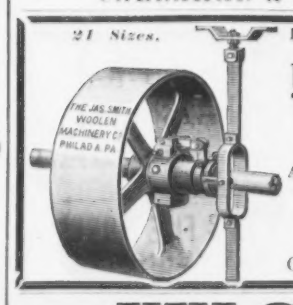
18 VESEY STREET.

"LITTLE GIANT TIRE UPSETTER."

No. 1 List 1200. No. 2 List 1500.

Cheapest and most durable and easiest worked of any in the market.
LIBERAL DISCOUNT TO THE TRADE.
— Manufactured by —
CALLAHAN & DOUGLAS, - Binghamton, N. Y.

21 Sizes. IT RUNS IN OIL. NO END THRUST.



HUB FRICTION CLUTCH,

Simplest, Most Durable and Most Effective.
Will Transmit from 1 to 1000 Horse-Power.

Address
JAMES SMITH WOOLEN MACHINERY CO.,
Works, 411 to 421 Race St., Cor. Crown,
Office and Store, 137 MARKET ST., PHILADELPHIA.

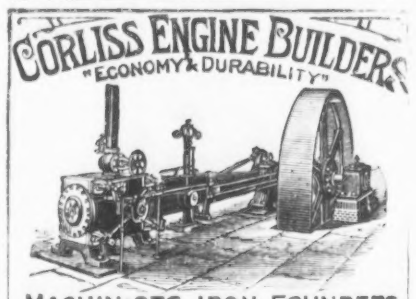
VULCAN WORKS.

BRASS AND IRON FOUNDERS AND MACHINISTS,

OFFICE AND STORE: 34 South 2d St., Philadelphia, Pa. W. H. GREEN.
OFFICE AND WORKS: Chester, Pa. W. H. GREEN, JR.

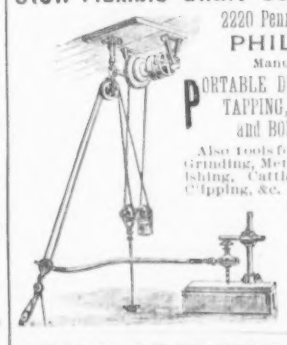
Manufacturers of and Dealers in Superior Brass and Iron Valves, Cocks, Oil Cups, Steam Whistles, Steam Gauges, BRASS MOUNTINGS. Cast, Flanged and Wrought Iron Pipe and Fittings. Engineers' and Machinists' Supplies. Steam and Gas Fitters' Tools and Supplies. Send for Catalogue and Price-List.

Machinery, &c.



MACHINISTS IRON FOUNDERS
BOILER MAKERS
ROB'T WETHERILL & CO.
CHESTER, PA.

Stow Flexible Shaft Co., Limited,



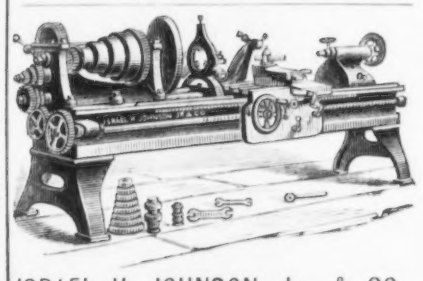
2220 Pennsylvania Ave.,
PHILA., PA.,
Manufacturers of
PORTABLE DRILLING, TAPPING, REAMING and BORING MACHINES
Also Tools for Emery Wheels Grinding, Metal and Wood Polishing, Cattle Brushing and Clipping, &c.
Gen'l European Agents,
Bolling & Lowe,
Lawrence Pountney Hill
LONDON, ENG.

PHILA. SHAFTING WORKS,

GEO. V. CRESSON
18th & Hamilton Sts.,
PHILA.

SHAFTING
A SPECIALTY

Manufacturers of Shafting, Pulleys and Hangers, Couplings and every appurtenance used in the Transmission of Steam Power.



ISRAEL H. JOHNSON, Jr., & CO.,
Tool and Machine Works
MANUFACTURERS OF
SPECIAL MACHINERY,
Improved Machinists' and Brass Finishers' Tools.
OFFICE, 1422 CALLOWHILL STREET
PHILADELPHIA, PA.

WOODWARD & ROGERS,
MANUFACTURERS OF

SURFACE GRINDING MACHINES

For Dies, &c.
Capacity, 12 inch x 6 inch.

HARTFORD, - - CONN.
SEND FOR PRICE LIST.

ALSO IMPROVED
Tapping Machines, Special Machinery and Tools.

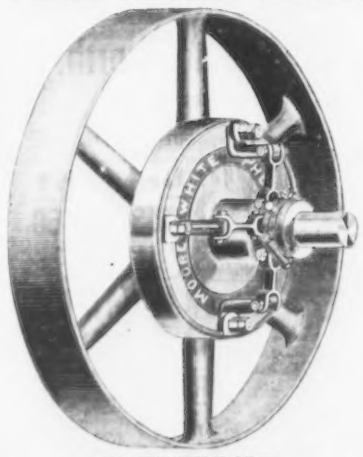
HOWARD IRON WORKS

BUFFALO, N. Y.,
Manufacturers of

BENCH VISES.

Price Lists sent on application

Patent Friction Clutch,



—MANUFACTURED BY—
MOORE & WHITE,
1312 Buttonwood St., Philadelphia, Pa.
Send for DESCRIPTIVE CIRCULAR and PRICE LIST

Tubal Smelting Works,

760 and 762 South Broad Street, PHILADELPHIA.

Paul S. Reeves,

MANUFACTURER OF

GENUINE BABBITT METAL

AND ALL GRADES OF

ANTI-FRICTION METALS.

Special Notice.—We call attention to our *new mixture*, THE P. S. R. "SPECIAL HARD" BABBITT. Equal to genuine, at 20 per cent. less price. Has now been in use about one year and thoroughly tested.

STANDARD STEEL CASTING CO.
THURLOW, PA
OPEN HEARTH AND CRUCIBLE
STEEL CASTINGS
QUALITY EQUAL TO STEEL FORGINGS

ESTABLISHED:

pring Making, 1842. Steel Making, 1845. Norway Iron, 1871 (Re-Rolled).

WM. & HARVEY ROWLAND,

MANUFACTURERS OF

Springs, Steel, Re-Rolled Norway Iron & Slit Norway Nail Rods.

ADDRESS:

FRANKFORD P. O., PHILADELPHIA.

EXTRA SUPERIOR CAST TOOL STEEL

STEEL TUBES WELDLESS
COLD DRAWN
SMOOTH INSIDE AND OUT
JOHN S. LENG, 4 FLETCHER ST. NEW YORK.

SAYLOR'S PORTLAND CEMENT.

Celebrated for its great strength and uniform quality. Especially adapted for use in the construction of Machinery Floors, Foundations for heavy Machinery, Engines, Blast Furnaces and any and all Wet or Dry work requiring great strength and solidity. Used for the past ten years for the annual repairs of the Croton Aqueduct, New York; also for the new Aqueduct, the Mississippi and New York Harbor Jetties, New York and Brooklyn Bridge (at critical points), Hudson River Tunnel, new Albany Capitol, Lighthouse Dept. (Gen'l Duane in charge) and other prominent work.

JOHNSON & WILSON, GENERAL AGENTS, 41, 43 & 45 Broadway, New York.

ROP HAMMERS.

Punching Presses.
DIES AND OTHER TOOLS
FOR THE MANUFACTURE OF ALL KINDS OF
SHEET METAL GOODS, DROP FORGINGS, &c.
Stiles & Parker Press Co.,
MIDDLETOWN CONN.

Branch Factory and Office: **203, 205 & 207 Centre St., New York.**

JENKINS STANDARD PACKING TRADE MARK

The Original Unvulcanized Packing

CALLED THE STANDARD—As it is the Packing by which all others are compared.

Accept no packing as JENKINS PACKING unless stamped with our "Trade Mark."

JENKINS BROS.,
71 John St., New York. 105 Milk St., Boston.
18 S. Fourth St., Phila. 54 Dearborn St., Chicago.

SHEPARD HARDWARE CO.,

MAMMOTH FOUNDRY. BUFFALO, N.Y.

STANLEY G. FLAGG & CO.,
PHILADELPHIA, PA.
Office and Works,
N. W. Cor. 19th St. and Pennsylvania Ave
MANUFACTURERS OF

STEEL CASTINGS

A Substitute for Steel and Wrought Forgings.

☞ Circulars Sent on Application. ☜

STEEL CASTINGS
Railroad and Machine Castings, ¼ lb. to 10 tons. Locomotive Cross Heads and Gearing a Specialty
Eureka Cast Steel Co.,
307 Walnut St., PHILADELPHIA.

POWER'S WAGON JACK.

Gentlemen who have nice stables want nice Wagon Jack. They want this one and will buy it at sight.

Price $1.50.
Trade discount 25 %.

MILLERS FALLS CO.,
74 Chambers St.,
NEW YORK.

FINE TAPS AND DIES.

LIGHTNING AND GREEN RIVER SCREW PLATES

BOLT CUTTERS, HAND AND POWER.
DRILLING MACHINES, PUNCHING PRESSES.
TIRE BENDERS, TIRE UPSETTERS
And Other Labor Saving Tools.
Send for Price List.
WILEY & RUSSELL MFG. CO., Greenfield, Mass.

Buffalo Forge Co.,

BUFFALO, N. Y.,

MANUFACTURE FULL LINE

Portable and Stationary Forges, Heating Furnaces, Power Blowers, Ex. Fans, and Blacksmiths' and Machinists' Drills.

JUST ISSUED!

AND MAILED FREE ON APPLICATION.

Catalogue No. 5, Jan. 1, 1887.

CLAYTON AIR COMPRESSORS,
ROCK DRILLS,
And General Mining Machinery.
For CATALOGUES, ESTIMATES, Etc., Address
Clayton Air Compressor Works,
Office, 43 Dey St., New York.

RUSSELL, BURDSALL & WARD,

PORTCHESTER, N. Y.,

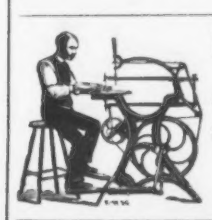
MANUFACTURERS OF

CARRIAGE, TIRE. **BOLTS** PLOW, STOVE, &c.

Carriage Bolts made from Best Square Iron a Specialty.

AXLES F. W. WURSTER, SPRING and AXLE WORKS. 375 to 387 Kent Ave., BROOKLYN, N. Y. **SPRINGS**

Send for Price List and Discounts.



FOOT POWER MACHINERY.

The Latest and Most Improved.

For Carpenters, Builders, Cabinet Makers, Pattern Makers, and all Wood Workers who are without Steam Power. Scroll Saws, Circular Saws, Mortising Machines Lathes, Etc.

New Catalogue Free.

SENECA FALLS MFG CO.,
255 Water St., Seneca Falls, N. Y.

SOLID STEEL CASTINGS,

FROM CRUCIBLE and OPEN HEARTH.
HYDRAULIC CYLINDERS AND GEARING SPECIALTIES.
GUN METAL ROLLS, PINIONS and CASTINGS.
AIR-FURNACE REFINED MALLEABLE CASTINGS.
ALL STOCK USED BY US IS SUBJECT TO CHEMICAL ANALYSIS IN OUR OWN LABORATORY.
ISAAC G. JOHNSON & CO.,
Established 1853. SPUYTEN DUYVIL. NEW YORK CITY.

PITTSBURGH STEEL CASTING CO.,

26TH AND RAILROAD STS., PITTSBURGH, PA.

MANUFACTURERS OF

Refined Bessemer Steel; ALSO Improved Steel Castings

UNDER HAINSWORTH'S PATENTS.

We are now prepared to fill orders for refined **BESSEMER BILLETS or BLOOMS** of any desired carbon and a uniform quality.

We would call attention of consumers to the fact that we use good material, and produce a steel pronounced by competent judges equal to the best English or German spring and soft steels.

Having had twelve years' experience in the making of **STEEL CASTINGS,** we are able to refer to our customers in all parts of the United States and Canada as to the quality of our work in this line. We make castings of steel practically free from blow-holes, as soft and easily worked as wrought iron, yet stiff, strong and durable, with a tensile strength of not less than 65,000 pounds to the square inch. In short, our castings unite the qualities of steel and wrought iron.

Wheels, Pinions, Cranks, Dies, Hammer Heads, Engines and Machinery Castings of all descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landsides.

Special attention given to Heavy Castings. We use no cast-iron in our Castings. Send for circular.

SAXTON & OSGOOD,

31 and 33 Lloyd St., BUFFALO, N. Y.

BARKER'S, RATCHET, EMPIRE,
Ball and Toy Braces,
Plain and Nickel Plated.

Manufacturers of ***BIT BRACES and HARDWARE SPECIALTIES.***

Catalogues and Price Lists furnished on application.

PRICE 5.00 **STEARNS' NEW BENCH DRILL**

LOW IN PRICE. HIGH IN FINISH.

24 inches high. Run of Screw, 3¼ inches. Bearings carefully finished with standard reamers. All parts interchangable. Extension crank for large drilling. Chuck holds ¾ round or tapered square drill

FOR SALE BY THE TRADE OR E.C. STEARNS & CO. SYRACUSE, N.Y.

SEND FOR CIRCULAR A

STUART'S WINDOW **SCREEN FRAME.**

Low in Price. Elegant in Finish. No Corner Irons. No Carpenter Work. No Mitering. Squares Itself. Finished in Black Walnut Stain. FOR SALE BY THE JOBBING TRADE.

SEND FOR CIRCULAR "A" E.C. STEARNS & CO. MANUFACTURERS SYRACUSE, N.Y.

STEARNS' **Hay Fork Pulleys.**

With Hardened Chilled Bearings.

Pins can be removed to permit the rope to be put in or taken off, or for oiling. The Swivel Eyes are turned and work perfectly free.

They are the Cheapest Pulleys in the Market.

MANUFACTURED BY E. C. Stearns & Co. SYRACUSE, N. Y.

Send for Circular A.

STAR SPRING HINGES.

About Ten Per Cent. Cheaper than the "Gem."

PRICE LIST—JAPANNED.

Length of Flanges.	Single Acting. Ball Tip. No.	Per Pair.	Double Acting. Ball Tip. No.	Per Pair
4 inch.	74	$0 80	94	$1.60
5 inch.	75	1.00	95	2.00
6 inch.	76	1.25	96	2.50
7 inch.	77	1.60	97	3.20
8 inch.	78	2.25	98	4.50

Same discount as "Am." and "Gem."

THE "STAR" HINGES contain the special features that have given to the "American" and "Gem" Hinges their deserved popularity.

Van Wagoner & Williams Co.

MANUFACTURERS,

82 Beekman St., New York.

STEEL CASTINGS,

Pratt & Letchworth,

BUFFALO, N. Y.

Orders and Correspondence Solicited.

UNIVERSAL RADIAL AND RADIAL DRILLING MACHINES

THREE DESIGNS. SIX SIZES.
EMBODY ALL DESIRABLE FEATURES
PRICES $450.00 & UPWARD
ADDRESS UNIVERSAL RADIAL DRILL CO
CINCINNATI, O. U.S.A.

PECK'S CHAMPION BLADE

A. G. PECK & CO.,
Cohoes, N. Y.,
MANUFACTURERS OF

AXES, ADZES, BROAD AXES, HATCHETS.

Send for Catalogue and Price List.

BRADLEY'S UPRIGHT CUSHIONED HELVE HAMMER

Established 1832.

Combines all the best elements essential in a first-class Hammer. Has more good points, does more and better work and costs less for repairs than any other Hammer in the World.

BRADLEY & CO. Syracuse, N.Y.

Bradley's Heating Forges

ESTABLISHED 1832.

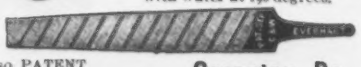
For Hard Coal or Coke. Indispensable in all shops to keep **Bradley's Cushioned Hammers** and men fully employed and reduces cost of production.

BRADLEY & CO. Syracuse, N.Y.

SCRANTON BRASS & FILE WORKS.

J. M. EVERHART,
Manufacturer of
BRASS WORK

For Water, Gas and Steam.
Exhaust Steam Injector, using Waste Steam only, returning it to Boiler with water at 190 degrees.



Also PATENT CUT FILES

Scranton, Pa.

Published by DAVID WILLIAMS, 66 and 68 Duane St., New York.
Printed by THE WILLIAMS PRINTING CO., General Book, Commercial and Newspaper Printers and Binders Nos. 5, 7 and 9 Elm St., New York.